







THE NATURALIST

A Quarterly Journal

Principally for the North of England

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THE YORKSHIRE NATURALISTS' UNION

ORNITHOLOGICAL SECTION

- A. From 1st January, 1968, the Hon. Secretary of the Ornithological Section will be:

M. DENSLEY,
50 Carr Manor View,
Leeds 17.

- B. Will any members, particularly those living on or near the coast, who visit any sea-bird colonies and who are willing to assist with 'A Survey of Attendance of Sea-birds at their Colonies', please write for the necessary information and forms to J. J. D. Greenwood, Dept. of Natural History, The University, Dundee.

- C. The Ornithological Section has had slips printed on which members can enter their observations of birds. These standardised forms will, it is hoped, ease the work of the recorders and stimulate a more steady flow of records.

Members who wish to acquire a supply for their private use can obtain bundles of 210 for 2/6 from the Report Editor (A. J. Wallis) preferably at the March and October Meetings.

- D. Will any members who have collected information about occurrences of oiled birds please send details without delay to the R.S.P.B., The Lodge, Sandy, Beds.
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THE NATURALIST

FOR 1968

THE NATURALIST, THE UNION AND THE FUTURE

At the end of 1963 the Union changed its printers. For 58 years *The Naturalist* had been printed in Hull. We had been well served by our printers there but the combination of increasing costs and the greater convenience of having editor and printer in the same town dictated the change to our present arrangements. The financial benefits of the change have proved to be short-lived, for printing costs throughout the industry have steadily mounted and the Union is now faced with a second and substantial increase in printing costs since Maney's took over the work.

Adverse balances of payments are so much in the news at present that most readers will be heartily tired of this depressing subject. But it is a problem which besets us too. The Executive of the Union has contrived so far to manage its affairs — admittedly less complex than those at the national level! — without running into debt and, we hope, without devaluing its service to Yorkshire naturalists. It has also contrived to do so without passing on the spiralling costs to members, for despite the totally changed values of the present as compared with pre-war days, the subscription to the Yorkshire Naturalists' Union has risen by a mere five shillings and that increase was made twenty years ago.

The Union is not a profit-making body and so long as we can pay our way without running into debt or sacrificing our standards in any way, we are satisfied. The Executive has always sought to avoid raising the subscription rate if at all possible and a considerable amount of energy and ingenuity has been expended in recent years by officers of the Union in seeking to circumvent the apparently inevitable. With the four issues of *The Naturalist* already absorbing the whole of each member's subscription our ability to do so any longer however is clearly not possible.

At the last Executive meeting it was decided however that, despite the ominous news of the further increase in printing charges amounting to an additional £140 per annum and the fact that our accounts for the past year show a credit balance of only £29, the subscription rate should **not** be increased for the coming year. A loss seems inevitable. It is certainly beyond our control now. **But it is not beyond yours.**

There are two ways in which members can give substantial help to the Union. Although our membership is higher now than at any time in the history of the Y.N.U., it is still far too low for a Society representing the largest English county. It should be double what it is, and if every member would make a point of introducing one recruit in the course of the year this target could be reached within twelve months.

Members of Affiliated Societies are entitled to attend meetings of the Union and many do so. Because of this entitlement they sometimes decline to become full members of the Union on the grounds that they do not thereby get added benefits proportionate to their subscriptions. May we suggest some rethinking about this? Would it not be more appropriate to substitute for the 'What do I get out of it' attitude a 'How can I support the interests of natural history' approach?

There is a second and very important way in which members can help. We are able to obtain from the Inspector of Taxes an additional sum by way of income tax repayment equal to 70% of your subscription if you sign a Deed of Covenant which commits you to remain a member for seven years. It is still not realised by many members how much they help the Union, without any cost whatever to themselves, if they covenant their subscriptions. Provided you have no more than £1. 15. 0. of income taxed at the highest rate or the equivalent amount of Building Society interest, it will not affect your own income tax or cost you any more if you pay your subscription by deed of covenant. And if you should die before the seven years are up the covenant is automatically cancelled and there is no liability on your estate.

We are grateful to the many members who have already arranged to pay their subscriptions in this way. The sum recovered on these covenanted subscriptions has provided the additional source of revenue which alone has made it possible to meet expenses additional to those connected with *The Naturalist*. If all others who are eligible would do so, no increase in subscription rate need be contemplated. To take so simple a step which will not cost you a penny but which will benefit the Union so much, is surely not an unreasonable request.

CHISLETT MEMORIAL LECTURE

The third Chislett Memorial Lecture was held in the University Lecture Theatre, Hull University, on Saturday, 9th September, 1967, under the chairmanship of Prof. N. F. Robertson.

James Fisher, the well-known broadcaster, author and ornithologist (and a member of the Union since 1947) showed Roger Tory Peterson's film 'Wild America'. With Peterson he had made a journey 'from Newfoundland to Alaska, via Mexico' to visit the many National Parks, Game Reserves, etc., of the North American continent. Peterson's excellent film documentary of their journey was enlivened for the large attendance at this Memorial Lecture, by James Fisher's vivid commentary. Though largely ornithological, the film contained much of interest to botanist and mammologist. Particularly memorable were sequences on the Limpkin (*Aramus guarauna*) on the various species of Alcidae, and on Blue Geese; while the confusion arising from the use of English names was brought home particularly in the case of Herons and Egrets, and Phalaropes.

Mr. Athol Wallis of Scarborough expressed the meeting's appreciation — already made obvious both by its attentiveness and spontaneous applause — to Mr. Fisher. He also thanked Mr. Brian Pashby, secretary of the Hull Scientific and Field Naturalists' Club, who had attended to all local arrangements. Seventeen local societies were represented at the meeting, sixteen answering the roll-call and Beverley who have recently become affiliated to the Union inadvertently omitted.

The Union is indebted to Mr. and Mrs. D. Cutts of South Cave for entertaining the speaker.

Y.N.U. AND Y.N.T. JOINT SYMPOSIUM

As one of the means of promoting an increased liaison between the Yorkshire Naturalists' Union and the Yorkshire Naturalists' Trust it has been decided to hold a Joint Symposium on 13-15 Sept, 1968. The meeting will be held in York where arrangements have been made for accommodation in one of the University Halls of Residence. The theme of the Symposium will be the "Changing face of Yorkshire".

Mr. E. Max Nicholson has agreed to attend and address the gathering and other distinguished naturalists have been asked to take part and to speak about their special knowledge of the impact of modern trends in land utilisation, etc., and their bearing on the problems of wild life conservation.

Those attending the full course will assemble at York on the Friday evening when a film will be shown. There will be three talks on the Saturday morning, a visit to a Reserve in the afternoon and a dinner followed by another speaker on the Saturday evening. More short papers will be given on the Sunday morning and after lunch a summing-up of the conference will be given. Discussion time will be allowed after each speaker.

The success of this venture depends upon the support which is given to it by members of both bodies. We hope that many Y.N.U. members will attend the whole Conference and that many more who are unable to do so will come for one or more days. Full details of speakers and charges for accommodation and for separate meals will be advertised later in *The Naturalist*. Meanwhile will members please note the date and will Secretaries of Affiliated Societies please bring the matter to the attention of their members. It is hoped that official representation of each Society will be arranged and that parties will be organised to attend on at least one day during the holding of the Symposium.

Spiders, Snakes and Other Outcasts by Robert Froman. Pp. 108, with 10 drawings by Leslie S. Heywood. Bell. 1967. 13/6.

A brisk account of some interesting biological facts concerning a selection of spiders, toads, snakes, cockroaches, bats and a few other animals that produce a feeling of repulsion in most people. An anxiety complex in flatworms, the colour-changes of octopuses, blood temperature control by reptiles, are some of the intriguing topics discussed. A stimulating book for anyone with a developing interest in biology or natural history, and an antidote to the feeling of disgust.

J.H.F.

THE YORKSHIRE NATURALISTS' UNION ONE HUNDRED AND SIXTH ANNUAL REPORT

The Hundred and Fifth Annual Meeting was held on 3rd December, 1966, at Hull, by invitation of the Hull Scientific and Field Naturalists' Club.

The Presidential Address entitled 'A Mycologist's View of Natural History' was delivered by Professor N. F. Robertson, and was subsequently published in *The Naturalist* 1-4, 1967.

The Presidency for 1968 has been offered to and accepted by James Fisher, Esq., M.A.

The Excursions for 1968 will be to:

V.C. 61	Pocklington Canal	20th July
V.C. 62	Hawnby	15th-16th June
V.C. 63	Bretton Park and Stockmoor	6th July
V.C. 64	Mickley	8th June
V.C. 65	Catterick	25th-27th May

The past year has again been one of continuing progress. Many enquiries have been made about membership and it is pleasing to record that this is now the highest in the Union's long history. Much information about the activities of the Sections as well as the Societies affiliated to the Union has been given in the Newsletters which all members have received.

The Union's Travelling Exhibition has been on view at several centres in Yorkshire including the Harrogate Festival, the British Association Meeting in Leeds and the Barnsley Naturalists' Society's Centenary Year Exhibition. In all cases it has received very favourable comment on the quality of the various panels featuring Yorkshire's wild life.

At the request of the West Riding County Council's Planning Officer the members and affiliated societies have been compiling schedules of sites of scientific interest in their own areas. Already more than 60 such sites have been listed and the inventory of those lying within the administrative area of the West Riding is being closely studied and recommendations made to the Nature Conservancy.

The Union's Executive has given further consideration to the question of closer co-operation between the Union and the Trust. It has not been found possible, however, to publish a joint Newsletter but it is hoped to arrange a joint weekend Conference in 1968.

The third Chislett Memorial Lecture was held at Hull on 9th September, when Mr. James Fisher, the well-known ornithologist, and one of our own members, showed the film 'Wild America' which he made with Roger Tory Peterson.

In common with most societies the Union is having to face rising costs particularly those connected with the charges for printing. The Executive has been considering ways and means of meeting these increases without making any increase in the rates of annual subscription.

Membership

At the time of writing the membership of the Union comprises one Honorary Life Member, 13 Life Members, 564 Ordinary Members, 52 Associates and 43 Affiliated Societies.

Deaths

We record with regret the death of the following members: Miss F. Bradley, Rev. P. M. Garnett, B. Linney, and Mrs. McGrigor Phillips.

Resignations

R. D. Ackerley, J. M. Bayldon, A. Dixon, Mr. and Mrs. H. B. Elenor, J. Govett, G. E. C. Hemingway, D. Holmes, Dr. P. G. Keates, Mrs. E. Lord, J. C. Maycock, J. Miles, Mr. and Mrs. K. Peller, G. Sayers, G. B. Wakefield, H. S. Walker, I. Walker, R. P. Wootton.

New Affiliated Societies

Beverley Natural History Society (Hon. Sec.: Mrs. M. E. Fox, 21 Alpha Avenue, Beverley).

Goole and District Natural History Society (Hon. Sec.: B. Greenacre, 33 High Street, Airmyn, Goole).

Change of Secretary

- Craven Naturalists' and Scientific Association (Hon. Sec.: P. M. Wright, Esq., 61 Regent Crescent, Skipton).
- Huddersfield Naturalist Photographic and Antiquarian Society (Hon. Sec.: Mr. E. C. J. Swabey, 46 Kennedy Avenue, Fixby, Huddersfield).
- Leeds and District Birdwatchers' Club (Hon. Sec.: J. S. Kenyon, Esq., 56 Estcourt Avenue, Leeds 6).
- York and District Field Naturalists' Society (Hon. Sec.: Mrs. G. Elliott, 20 Hempland Lane, York).
- Harrogate and District Naturalists' Society (Hon. Sec.: Mrs. A. M. Melford, 16 Beckwith Road, Pannal Ash, Harrogate).
- Hull Geological Society (Hon. Sec.: Mrs. Joan M. Ward, 21 Elmfield Drive, Cottingham, E. Yorks.).

Change of Address

- Arnott, Mrs. J. N., 73 Frenchgate, Richmond, Yorks.
- Bell, D. G., 'Rosenmas', 18 Rosedale Crescent, Guisborough.
- Bennett, G. R., 'Fairweather', Hunt's Hill, Blunsdon, Nr. Swindon, Wilts.
- Blakeway, J. E., Oak Busks, Back Lane, Alne, York.
- Clarke, R. O. S., 78C Granville Road, Sevenoaks, Kent.
- Collins, J., Litton Mills Field Studies Centre, Litton Mills, Buxton, Derbyshire.
- Cutts, D. B., 81 Beverley Road, South Cave, Nr. Brough.
- Fisher, J., Ashton Manor, Northampton.
- Grainger, Miss J., Oaklands, Turnshaw Road, Kirkburton, Huddersfield.
- Harnett, Mrs. V. M., 361 Spen Lane, Leeds 16.
- Harris, R., 16 Main Street, Barwick-in-Elmet, Leeds.
- Heald, H., Cleveland, 2 St. John's Road, Loughton, Essex.
- Jackson, E. E., The Wildfowl Trust, Slimbridge, Glos.
- Lush, R. L. G., 32 Matthews Green Road, Wokingham, Berks.
- Martin, S., 'Garlies', The Park, Swanland, N. Ferriby, E. Yorks.
- Medd, Mr. and Mrs. T. F., 53 Bootham Crescent, York.
- Rider, A. H., The Infirmary, Workington, Cumberland.
- Rutherford, C. I., Longridge, Macclesfield Road, Alderley Edge, Cheshire.
- Sanderson, Miss M. R., 51 Lancaster Park Road, Harrogate.
- Simpson, G., 37 Whitfield Avenue, Pickering.
- Speake, B., Greenhow, West Rounton, Northallerton.
- Spalding, D. A. E., Provincial Museum and Archives of Alberta, Edmonton, Alberta, Canada.
- Stembridge, H. L., Hall Farm, Crakehall, Nr. Bedale.
- Walker, J. E. S., 27 Westgate, Hornsea.

New Members

- Appleby, R. H., 38 Tennyson Avenue, Scarborough (O).
- Blundell, Miss Margaret, 158 Otley Road, Leeds 16 (B.Br.M.).
- Bower, Mrs. M., 17 Woodlands Rise, Silkstone Common, nr. Barnsley (A).
- Broadhead, E., M.A., B.Sc., D.PHIL., F.R.E.S., Zoology Dept., The University, Leeds 2 (E).
- Burn, Mr. and Mrs. D. M., 6 Dargai Street, Leeds 7 (E.Z.).
- Clarke, H., 129 Morthen Road, Wickersley, Rotherham (B).
- Darwood, H. A., 3 Avenue Terrace, Clifton, York (B).
- Dix, Mrs. A. M., B.Sc., 25 Kennedy Avenue, Fixby, Huddersfield (Z).
- Ellam, J. D., 349 North Road, Anlaby Road, Hull (O.Z.).
- Ellerby, C., 52 Bondgate, Helmsley (O).
- Elsworthy, G. C., 47 Ogden House, Danecourt Road, Holme Wood, Bradford 4 (O).
- Field, J. H., B.Sc., 34 Wells Green Road, Sheldon, Solihull, Warwickshire (Br.).
- Fields, Miss Lynda C., Outwood, Treeton Lane, Aughton, Sheffield (O.Z.).
- Fitzgerald, Miss Jean, Dale Hall, Elmwood Road, Liverpool 18.
- Flint, P. W. H., 7 Norfolk Terrace, Leeds 7 (E).
- Gilleghan, J. A., B.Sc., M.I.BOL., 383 Selby Road, Whitkirk, Leeds 15 (B).
- Greenhalgh, M. E., St. Mary's Vicarage, Brockholes View, Preston.
- Handley, J. F., 30 Lee Green, Mirfield (O).
- Hartley, C., 26 Hazel Crescent, Chickenley, Nr. Dewsbury (B).
- Hartley, Miss M. M., B.Sc., The Yorkshire Museum, York (Br.).

Herringshaw, D., 64 Butterthwaite Road, Sheffield 5 (B.E.O.).
 Huddleston, Miss F., Kildare Bungalow, Baghill Lane, Pontefract (M.Z.).
 Kemsley, Mr. and Mrs. J., 36 Partridge Flatt Road, Bessacarr, Doncaster.
 Land, A. E., 23A High Street West, Uppingham, Rutland (G.O.).
 Marjoram, Mrs. D., B.Sc., 106 Bolling Road, Ben Rhydding, Ilkley.
 Metcalfe, R. J. A., M.A., Trinity and All Saints Colleges, Horsforth, Nr. Leeds.
 Miller, Miss Joan B., 9 Wheatley Lane, Ben Rhydding, Ilkley (B).
 Norris, A., City Museum, Municipal Buildings, Leeds 1 (C).
 Oldfield, P., B.A., 10 Danebury Drive, Acomb, York (E.Z.).
 O'Shea, B. J., 44 Lee Park, Blackheath, London S.E.3 (Br.).
 Paget, R. J., B.Sc., M.B., CH.B., 13 The Baulk, Worksop, Notts. (B.Z.).
 Palmer, M. J., 5 Magbridge, Honley, Huddersfield (O).
 Roberts, Mr. and Mrs., 9 North Park Road, Bradford 9.
 Simpson, C., 17 Sutherland Grove, Norton, Stockton-on-Tees.
 Spray, M., Wills Hall, Stoke Bishop, Bristol 9.
 Sutton, S. L., B.A., D.PHIL., Zoology Dept., The University, Leeds 2.
 Swabey, E. C. J., 46 Kennedy Avenue, Fixby, Huddersfield.
 Thurston, Miss H. M., 112 Simonside Terrace, Heaton, Newcastle upon Tyne 6.
 Upton, T. W., 'Sternes', Westwood, Beverley (O).
 Vernon, Miss N. G., 22 Parish Ghyll Road, Ilkley (B).
 Winter, P. Q., West House Farm, Muston, Filey (E.O.).

MAMMALS, REPTILES, AMPHIBIANS AND FISHES

T. M. CLEGG

1967 has seen an increase in the number of people submitting records for inclusion in this report, but the coverage of the county as a whole remains patchy. In particular the north-west and part of the West Riding would benefit from increased activity amongst our members. The East Riding, the Scarborough district and the area around York have given rise to the greatest number of records and these have been channelled to me by Society recorders. The volume of fish records received from the Scarborough area is the greatest since W. J. Clarke collected records in the area and is largely the work of C. I. Massey, who has sent records for this and past years. Very few records of reptiles and amphibians have been received and in these groups there is concern about the status of various species nationally, so all records will be appreciated during the following year. Because records may not actually appear in this report it should not be thought that they are unimportant — all are filed and add to the body of information on the fauna of the county. It is gratifying to see that so many animals which are found dead or killed, accidentally or deliberately, are passed on to museums. Records which are backed by a specimen and from which full data is extracted during the preparation of this material are especially important in this day and age. Whilst not advocating deliberate collecting to an excessive degree, I can assure anyone who is in a position to pass this sort of material on to a museum that it is appreciated.

MAMMALIA

INSECTIVORA

Hedgehog: Road mortality reports from the Scarborough area give peaks in April-May and August-September, the only winter death being one at Rillington on 23rd December, 1966. A 300 yard stretch of road at East Ayton had 10 dead hedgehogs between April and August (C.I.M.) A *Scarborough Evening News* report told of up to 25 individuals being present in a garden in the town on one evening in August. Reports from elsewhere indicate status normal, but close study of road mortality is desirable.

Pigmy Shrew: Records from the following localities: near Allerthorpe Common (Miss V. Maltby), Wilton Park, Batley (T.M.C.), and the following localities near Scarborough; Muston, Cayton, Hutton Buscel, Raincliffe Woods and Newby (C.I.M.). A female at Newby, killed by a cat on 11th September, contained four full term embryos.

Water Shrew: Records from River Greta (Y.N.U. Excursion rep., C.S.), Central Vale of York, Pickering, Thirsk, Scugdale and Oswaldkirk (C.S.), Muston, Scalby, Hackness, Hay Bridge, Hutton Buscel, Stoupe Beck and Langdale End (C.I.M.). Good numbers were referred to in a report from Kelleythorpe (Mr. Upton per Mrs. G. de B.).

Mole: High mortality in the Vale of Pickering during the first week of July — suggested causes, worms burrowing too low for moles to follow or hard ground forcing moles to hunt on the surface (C.I.M.). A pinky-white individual was trapped near Pickering in May. A dead female at Hunmanby on 27th April contained four embryos, eight mm. long (C.I.M.). A report from the York area that the species has been very inconspicuous this year seems rather against the trend of other reports (C.S.).

CHIROPTERA

Daubenton's Bat: One, mist netted at Wath Ings on 28th August, was kept for a few days and then released (H. E. Beaumont).

Long-eared Bat: Reported only from Bretton Park (M.B.).

Pipistrelle: Records from Beverley, Bretton Park and Scarborough, where activity was noted on 10th January, 1967. The Bretton example was sharing a tree-hole roost with Noctules.

Noctule: Three, at roost in tree-hole, Bretton Park in May (M.B.). A large bat, probably of this species, was seen flying high amongst Swifts at Beverley on 31st July.

LAGOMORPHA

Blue Hare: Two were seen in the usual area above the Yorkshire-Derbyshire border in April (C. Jukes). A Dewsbury poulterer had the Scotch and Irish forms of this species on sale during the year.

Brown Hare: Very few records; mentioned as frequent near Whitby (A. G. Walker) and were given the same status at Salendine Nook, Huddersfield (A. Norcliffe). At Batley, this species is uncommon, probably due to shooting pressure (T.M.C.). Widespread in the Scarborough area (A.J.W.).

Rabbit: Occasional (A.B.W.) and rare (A.N.) in the summaries of the two observers mentioned previously. Increasing rapidly in the areas round Scarborough and also apparently increasing in many parts of the East Riding, though myxomatosis still present at Cliffe. Over a hundred were reported in a field at South Cave and over 50 near Huggate (B. S. Pashby); there is also a small colony in the grounds of Hull University. At Batley too it is mainly a Park and garden species — with some apparently living under the museum.

RODENTIA

Red Squirrel: Reported from Newmillerdam (J. Boothman) and Bretton Park and two spent the winter in the grounds of Huddersfield museum. It would appear that the south-western part of the West Riding is still one of the few strongholds of this species. In the East Riding the species continues to be reported from the Wassand Hall Estate and one was reported on the Y.N.U. excursion to Barningham.

Grey Squirrel: Not apparently gaining ground much at present, though odd individuals have occurred in Peasholm Glen, Scarborough and two were seen in Bretton Park.

Water Vole: The type and condition of inhabited streams do not appear to matter much to this species. Common in the Batley area on streams heavily charged with pollution, and equally abundant on the River Hertford and parts of the River Derwent as well as in the East Riding carrs.

CARNIVORA

Fox: Eight were shot on an organised shoot at Flamborough in February. Apparently common and well distributed in the East Riding. In Batley the species occupies any available marginal land and the town's Parks. During the summer one was killed on the roof of a farm house within the town boundary.

Badger: Two young from a sett at Cawthorne were killed by cars (J. Seago per R.S.A.). Other traffic victims were an adult male near the North Bay bathing pool, Scarborough, a female near Silpho village, a female near Wentbridge and another on the nearby A1. At least twelve individuals are claimed to be present in the West Bretton area, where one pair had three cubs (M.B.). An adult and three cubs were seen at Deepdale, Beverley, and two cubs were reported from the Scarborough town sett. A flourishing sett is reported at Skirlaugh (G. de B.). On 25th July a badger was found in a snare at Lowdales, Hackness, by C.I.M. I quote from his notes on this, 'The snare was chained to a tree and had bitten deep into the chest of the animal. The wound

was a mass of flies and the badger had probably been there three to four days'. A further incident in the chronicle of barbarity against this species.

Following a reference to Badger gassing in a recent Y.N.U. Newsletter, Mr. S. P. Clark has sent me the following statement regarding the Ministry of Agriculture's attitude towards Badger control.

'The matter of the responsibility of officers of the Ministry of Agriculture, Fishes and Food, for gassing Badgers, has been raised in the past, and I can only regret the recent positive inference in this respect in No. 3 Newsletter. The Ministry's attitude in this matter is quite clear. The Badger is not regarded as a significant pest of agriculture and, in fact, may often be beneficial both to agriculture and forestry. In the uncommon event of a "rogue" badger attacking poultry, shooting by a competent marksman of the animal concerned is the recommended method of control. Gassing is illegal.

'These views have been clearly stated to the Federation of Rabbit Clearance Societies which has reproduced them for the benefit of Societies' warreners. These warreners are not Ministry employees. As a member both of that Ministry's staff and the Yorkshire Naturalists' Union, I have again had enquiries made and been assured that no Ministry officer is responsible for this practice; if any Union member has evidence to the contrary an official enquiry will be made.'

American Mink: Escapes of this species continue as does the Ministry of Agriculture's anti-mink campaign. New localities this year include Dunkeswick, near Harewood and Tickton near Beverley and also on the Ouse-Wharfe junction at Selby.

Polecat-ferret: One was killed in Bretton Park on 26th June. The increase in records of this form of the ferret, often virtually indistinguishable externally from the wild polecat, continues.

Otter: Bred in V.C. 62 in the Central Vale district, (C.S.) and also on Humberside to the west of Hull (G. de B.). A national survey of this species is about to commence and any records will be appreciated in the coming year. In view of the continuation of Otter hunting precise localities will only be given to *bona fide* enquirers.

PINNIPEDIA

Grey Seal: One frequented Scarborough harbour during January, 1967 and two young animals were taken to Flamingo Park Zoo from this area during December. The practise of carting young marine mammals off to zoos may influence any future colonisation of the county.

ARTIODACTYLA

Fallow Deer: About 32 are present in the Bretton-Cawthorne area (M.B.). A pair and one young were seen in Weldrake Woods in September (Mr. Blanchard per G. de B.), and the presence of the herd on Skipwith Common was further confirmed by a specimen which went to the Yorkshire Museum.

Red Deer: One was seen on 24th August at Hardcastle Crags, Hebden Bridge by C. Gordon Booth. This would appear to be the first record of this species in the Halifax District.

Roe Deer: Reports received early in 1967 confirm the high population in the Allerston Forest area and there have been further reports from Silpho. One was seen on Skipwith Common in March (B.S.P.). *Caution*. There have been no reports for two years of Sika Deer, though these were seen in some numbers in the west of the county and it is a species which is widely kept in semi-captivity. Observers should take this species into account when making identifications.

CETACEA

(*Pilot Whale*): A single whale, believed to have been of this species, was seen off the Marine Drive Scarborough, in August (T.M.C.).

Porpoise: A male, four feet long, was captured in the River Idle on 24th May (P. Skidmore). This must have passed through part of Yorkshire at least to arrive so far inland.

REPTILIA

Slow Worm: One was found at Airedale, Castleford, in late September, possibly an escape (R. F. Dickens). Reported in the north-east from High Yedmandale, 30th March, Low Yedmandale and Broxa (C.I.M.).

Common Lizard: Reported from Barningham, Wycliffe, Ellerburn Bank Nature Reserve, Fen Bog, Fylingthorpe Moor and in the York area. Apparently had a good year.

Grass Snake: Reported from the Doncaster area, Selby, Hull, Boroughbridge, Ripon and York — with the possibility of some of these being escapes.

Diced Snake (Natrix tessellata): This species has figured widely as an escape or an accidental import and may conceivably become established in the future. Records from Hull (2), elsewhere in the East Riding (2), York (1), Vale of Pickering (1), (C.S.), and from Doncaster (1) (A. H. White).

Adder: A good year for Strensall Common where the species is reported as present on the Y.N.T. Reserve (C.S.). Also reported from Dalby Bog, Harwood Dale, Langdale Moor, Goathland and on the cliffs near Cloughton (C.I.M.).

AMPHIBIA

Crested Newt: There has been an apparent decline in the York area over the period 1965-7 (C.S.). Reported from the Scarborough area at Seamer Gravel Pits, Raincliffe Manor, Cayton Bay and Muston — common in all localities (C.I.M.). Also present in Bretton Park (M.B.).

Palmate Newt: A male was found in a pond at Raincliffe Manor in April and appears to be the first record for this area for a number of years. An unconfirmed report has been received from Stainborough near Barnsley.

Common Frog: This species in common with the other amphibians is the subject of a national enquiry at present, but very few reports have been received. In the Batley area members of Batley Museum Society found frogs in all suitable localities and there were great rafts of spawn in the Needless Dam, near Morley, though this dried out completely by mid-summer.

Common Toad: The Scarborough area was well covered, but again records have been comparatively few generally. During the spring A. J. Wallis made a census of toads dead on the road at Throxenby Mere, clearing up the previous night's kill each time and the following figures resulted from his observations. In all a total of 265 toads were killed during the period covered.

No.	Date	No.	Date	No.	Date
1	30/3/67	23	16/4/67	2	28/4/67
5	4/4/67	57	18/4/67	0	29/4/67
36	5/4/67	2	19/4/67	4	30/4/67
1	7/4/67	23	20/4/67	0	1/5/67
6	9/4/67	4	22/4/67	0	2/5/67
0	11/4/67	14	23/4/67	0	3/5/67
2	12/4/67	30	25/4/67	3	5/5/67
5	14/4/67	0	26/4/67	40	6/5/67
7	15/4/67	0	27/4/67	0	7/5/67

None seen after 7/5/67

Midwife Toad: The York colony persists but does not appear to spread (C.S.).

PISCES

Lampern (Lampetra fluviatilis): Reported from the River Ouse in May (C.S.).

Brook Lamprey (Lampetra planeri): Reported from Cod Beck near Thirsk in October (C.S.). Several were found in the River Derwent at Langdale End in May (C.I.M.).

Thresher Shark: One reported near entrance of Whitby Harbour on 14th September, said to be 14 feet long. This could have been of the same species, if not the same individual, as a shark seen off Saltburn on 28th August, 1967 (C.I.M.).

Salmon: Several taken from the Ouse this year, suggesting a better run than usual (C.S.).

Trout: A specimen of ten pounds six ounces was taken from the River Rye in July.

Rudd: Live specimens caught at Bentley Cuttings, near Doncaster, were received by Doncaster Museum in October (P. Skidmore).

Dace: Presence in the River Ouse at York confirmed (C.S.).

Stone Loach: Common in Pickering Beck at the head of Newtondale (C.I.M.). Found in River Fosse (C.S.).

Flying Fish: One, found amongst Herrings on the fish pier at Hull, in early October. It was believed to have been caught by a Scottish drifter fishing off the Yorkshire coast. This specimen, the first record since 1894, is now in the Scarborough Museum collection (C.I.M.).

Deal Fish: One, washed ashore in North Bay, Scarborough, on 24th August, 1967, length 6 ft. 6 in. minus tail. A previous record for 6th June, 1964 at Filey, does not appear to have been previously reported (C.I.M.).

John Dory: Two caught off Scarborough in June were both exhibited in the Tunny Club hut (C.I.M.).

Boar Fish: One was found on the fish pier at Scarborough during late August. The specimen unfortunately disappeared — believed eaten by Herring Gulls (C.I.M.).

Ray's Bream: One caught off Scarborough on 27th September, one or two other records towards the end of the year (C.I.M.).

Red Mullet: One caught off Scarborough 11th June, exhibited in Tunny Club hut (C.I.M.).

Red Gurnard: One seen on Scarborough fish pier on 19th August (C.I.M.).

Sapphirine Gurnard: One caught by local keel boat off Filey Bay on 25th May (C.I.M.).

Halibut: A specimen weighing 201 pounds was caught a few miles off Whitby on 19th June: this is five pounds heavier than the largest recorded by W. J. Clarke (C.I.M.).

Connemara Sucker: Recorded from Cayton Bay and Cloughton Wyke in March, 1953 by Hull University zoologists.

Two-spotted Sucker: Recorded from Robin Hood's Bay, Cayton Bay, Whitby, Scalby Ness and Burniston Bay in March, 1950 by Hull University zoologists.

Observations were received on the following species, but these on the whole confirmed previous reports and did not establish new localities or changes in status.

Mammals

Common Shrew	Wood Mouse	Stoat
Bank Vole	Brown Rat	Weasel
Short-tailed Vole	House Mouse	Porpoise

Amphibians

Smooth Newt

Fishes

Tope	Roach	Whiting	Montagu's Blenny
Piked Dog Fish	Bream	Coalfish	Butterfish
Herring	Eel	Lesser Fork-beard	Grey Gurnard
Pike	Garfish	Perch	Miller's Thumb
Carp	Hake	Ruffe	Lumpsucker
Gudgeon	Cod	Lesser Sand Eel	Three-spined Stickleback
Minnow	Haddock	Lesser Weever	Ten-spined Stickleback
Chub	Bib	Mackerel	

List of contributors — with apologies for any omissions.

R. S. Atkinson	Mrs. G. de Boer	M. Brooke
H. E. Beaumont	Mr. G. de Boer	T. M. Clegg
Mr. Blanchard	C. Gordon Booth	R. F. Dickens

C. Jukes
Miss V. Maltby
C. I. Massey
A. Norcliffe

B. S. Pashby
Mrs. G. Pashby
C. Simms
P. Skidmore

Mr. Upton
A. B. Walker
A. J. Wallis
A. H. White

ORNITHOLOGY

(R. F. Dickens): Full meetings of the Section were held in Leeds University on the third Saturdays in March and October, in conjunction with the Fishes, Amphibians, Reptiles and Mammals Section. At each of these meetings A. J. Wallis and J. K. Fenton summarised the ornithological records for the intervening six months for the county and for Spurn Bird Observatory respectively. Four new species for the county had been recorded, Greater Black-headed Gull, Blue-winged Teal, Thrush Nightingale and Baird's Sandpiper. Mr. Wallis emphasised the need for restraint on the part of people wishing to see rarities; for observing a code of conduct which both respected private property and the interests of local naturalists. It had been a remarkable autumn for terns and skuas. At Spurn, Golden Oriole, Red-rumped Swallow, Crane and Alpine Swift had been seen; while in autumn Redpolls and Twites were unusually numerous, Yellow-browed Warblers earlier than usual and four Sabine's Gulls had been seen. For the third year in succession Spurn Bird Observatory has produced its separate report. The Committee and the Spurn Warden are to be congratulated both on the excellence of the 1966 Report and the promptness with which it has again appeared.

Whilst the Protection of Birds Act Committee has held only one meeting during the year, it has been very active in a number of directions. Schools throughout the county have received posters outlining the basic principles of the 1954 Protection of Birds Act. An appeal has been launched for funds for protection work and is already showing a pleasing response. A list of those who have so far subscribed was displayed at the October Joint Vertebrate Sections Meeting. A further Act became law in 1967 and the Hon. Secretary is engaged in summarising this for the information of members.

The Reports Committee met formally in March and November, as well as informally on a number of occasions when the attendance of members at some event made further discussions convenient. The process of circulating and commenting on records is, of course, a continuous one — and often enlightening. I am sorry to say that it is still not possible to forecast when the Ornithological Reports for 1965 and 1966 will be in members' hands, but I can assure you that the committee has been spending considerable time and effort on this problem. After consultation with the Editor of *The Naturalist* and with the Y.N.U. Executive it has been decided to print the 1965 and 1966 reports together, but separate from the quarterly issues of *The Naturalist*. Members will be informed as soon as these reports are available. The committee was represented at a conference for Editors of local reports organised by the British Trust for Ornithology, in September.

In March, the Section held a joint meeting with the Bradford Naturalists' Society at the Connaught Rooms, Bradford, when George Waterston gave a lecture 'Expedition to West Greenland, 1965'. We are indebted particularly to Mrs. Butcher of the Bradford Society and to Mr. J. K. Fenton for the arrangements for this highly successful event.

R.S.P.B. films are now shown with a fair degree of regularity in various centres in the county, but it was something of an event when Bradford was included in an autumn tour during which a number of the R.S.P.B. staff themselves attended and showed the Society's three 1967 releases. For the first time, too, the Royal Society for the Protection of Birds had a stand at the Great Yorkshire Show from 11th to 13th July, when they were ably assisted by members of the Harrogate Naturalists' Society. At the second Harrogate Festival of Arts and Sciences during August, when the theme was 'Nature and Man' the Harrogate Society staged a number of ornithological exhibits. Yorkshire Ornithology is to be the theme of one of the sessions at the 1967 B.T.O. Conference at Swanwick.

On 24th September, a bird-watching sea-cruise from Scarborough was arranged for the second year in succession. Sooty Shearwaters and Little Gulls were among the birds seen. The migration of no fewer than 150 ornithologists to Scarborough for the occasion is an indication both of how worth-while members consider this project and how greatly indebted we are to A. J. Wallis for making the necessary arrangements.

By contrast, attendance of ornithologists at the field meetings of the Union during this past year has been more lamentable than ever. The field meetings are among the most important engagements in the Y.N.U. calendar and I cannot too strongly urge members to remedy this situation, nor too strongly stress the importance of exploring areas normally not well covered. Their bird-life should be adequately recorded on these occasions.

If I may be permitted to end on a personal note, I particularly regret that after twelve years as secretary of the Ornithological Section I have felt compelled to resign just at the time when the Union President will be an ornithological one. I feel sure that members will accord their loyal support both to James Fisher, the 1968 Y.N.U. President, and to my successor as secretary who will be M. Densley, of 50 Carr Manor View, Leeds 17.

CONCHOLOGY

(E. Dearing): The section has held five meetings in Leeds City Museum by kind permission of the Director. There have been four sectional field excursions but members have not attended the Y.N.U. excursions on as many occasions as would be desirable.

Mr. J. Armitage has been responsible for addresses on two occasions; in November he spoke on *Pomatias elegans* and in January dealt comprehensively with *Lymnaea*. Mrs. N. F. McMillan described the 1965 International Malacological Congress, held in Denmark, and Mr. E. Thompson showed many coloured slides of 'Molluscan habitats'.

The weather proved unkind on the occasions of meetings at Ryhill in April, Tadcaster in May and Skipton in October. Heavy rain on each occasion made collecting unpleasant although the Tadcaster meeting was enlivened by a lunch arranged in congenial surroundings. At Wentbridge in September three areas were visited: *Helix pomatia* was not found at its habitat but a revisit to the area by Mr. R. Carr produced *Helicella itala*, new to the area. Perhaps the most important find during the year has been that of *Arion lusitanicus* new to Yorkshire, found in Leeds City by Messrs. Armitage and Norris. Mrs. M. Fogan took *Vitrea subrimata* Reinhardt in May 1966 in Oxenber Woods, Austwick and this has proved to be new to Britain.

The following species have been observed by members of the Section, particularly Mrs. M. Fogan and Messrs. A. Norris, S. A. Appleyard, E. Robinson, E. Thompson and R. Carr who have kindly supplied lists.

The localities are as follows: (1) Bolton-by-Bowland, (2) Road to Stocks Reservoir, (3) Near to Tosside; on the occasion of the Y.N.U. visit in 1966, (4) Near Gunthwaite, (5) Pond on Emroyd Common, Dewsbury, (6) Bishop's Dyke near Sherburn-in-Elmet, (7) Woods near Ledsham, (8) Coxley Valley, near Dewsbury; all 1966 records: (9) Blubberhouses, Sept. 1966, (10) Birken, (11) Selby Canal, (12) Roche Abbey, (13) Leeds City, Oct. 1966, (14) Winterset and Ryhill, 8.4.67, (15) Wentdale, 2.9.67, (16) Tadcaster, and (17) Bolton Percy, 6.5.67, (18) Oxenber Woods, Austwick, records from May 1966.

Viviparus viviparus (L.), 14
V. fasciatus (Müller), 10
Valvata piscinalis (Müller), 14, 17
Potamopyrgus jenkinsi (Smith), 2, 14, 16
Bythinia tentaculata (L.), 14, 17
B. leachi (Sheppard), 14, 17
Carychium minimum Müller, 1, 4, 16, 17
C. tridentatum (Risso), 15, 18
Lymnaea truncatula Müller, 16, 17, 18
L. glabra (Müller), 10, 14
L. palustris (Müller), 14, 17
L. stagnalis (L.), 14
L. auricularia (L.), 14
L. peregra (Müller), 14, 17
Aplexa hypnorum (L.), 17
Physa fontinalis (L.), 5, 17
Planorbis barbus (L.), 11
Planorbis carinatus Müller, 14

Planorbis planorbis (L.), 14
P. vortex (L.), 14
P. leucostoma Millet, 14, 17
P. albus Müller, 6, 14, 16
Segmentina complanata (L.), 14
Acoloxus lacustris (L.), 14
Succinea putris (L.), 1, 15, 17
Cochlicopa lubrica (Müller), 1, 9, 14, 15, 16, 17, 18,
C. lubricella (Stabile), 15, 16, 18
Pyramidula rupestris (Drap.), 1, 2, 3, 18
Pupilla muscorum (L.), 1
Lauria cylindracea (da Costa), 1, 9, 15, 18
Abida secale (Drap.), 18
Acanthinula aculeata (Müller), 18
Vallonia costata (Müller), 15
V. pulchella (Müller), 17

- Ena obscura* (Müller), 12, 15, 18
Marpessa laminata (Montagu), 7, 15, 18
Clausilia bidentata (Ström), 15, 18
Balea perversa (L.), 2
Cecilioides acicula (Müller), 8, 12
Arianta arbustorum (L.), 3, 18
Helix hortensis (Müller), 1, 15
H. nemoralis L., 1, 14, 15, 16, 17
H. aspersa Müller, 1, 15, 16
Hygromia striolata (C. Pfeiffer), 1, 9, 15, 16, 17, 18
H. hispida (L.), 1, 9, 14, 15, 16, 17
Monacha cantiana (Montagu), 15, 16
Helicella itala (L.), 15
Discus rotundatus (Müller), 1, 9, 14, 15, 16, 17, 18
Arion intermedius Normand, 14, 15, 16, 18
A. circumscriptus Johnston, 14, 15, 16, 17, 18
A. hortensis, Férussac, 9, 14, 15, 16, 17
A. subfuscus (Draparnaud) 9
† *A. lusitanicus*, Mabile, 13
New to Yorkshire
Eucomulus fulvus (Müller), 1, 9, 15, 17, 18
Vitrea crystallina, (Müller), 17, 18
† *V. subrimata* Reinhardt, 18
New to Britain.
- V. contracta* (Westerlund), 14, 15, 18
Oxychilus draparnaldi (Beck), 15
O. cellarius, Müller, 1, 14, 15, 16, 17, 18
O. helveticus (Blum), 1, 15
Retinella radiatula (Alder), 8, 18
R. pura (Alder), 1, 9, 15, 18
R. nitidula (Draparnaud), 9, 16, 17, 18
Zonitoides excavatus (Alder), 14
Vitrina pellucida (Müller), 9, 15, 18
Milax budapestensis (Hazay), 16
Limax maximus L., 1, 14, 15
L. flavus L., 13
Lehmannia marginatus Müller, 9
Agriolimax reticulatus Müller, 1, 9, 14, 15, 16, 17, 18
A. laevis (Müller), 14, 17
Anadonta anatina (L.), 14
Sphaerium rivicola (Lamarck), 11
S. corneum (L.), 14, 15
Pisidium casertanum (Poli), 14
P. personatum Malm, 14, 17
P. obtusale (Lamarck), 14
P. milium Held, 17
P. subtruncatum Malm, 14, 17
P. henslowanum (Sheppard), 14
P. nitidum Jenyns, 14
Dreissena polymorpha C. Pallas, 14

Nomenclature is according to the *Census of the Distribution of British Non-Marine Mollusca*, 1951.

ENTOMOLOGY

Coleoptera (E. W. Aubrook): Continuing study of the more difficult genera amongst the Coleoptera, and collecting in comparatively little-worked localities, have resulted in the inclusion in this report of 15 species new to Yorkshire and 43 new to one vice-county or another. Mr. C. Johnson's recent work on the genus *Acrotrichis* has enabled three species of these minute beetles to be added to the British list from Yorkshire localities. An additional species was first recognised as British from specimens collected in the Stocks Moor Nature Reserve.

Master Jeremy D. H. Flint's enthusiastic collecting of water-beetles has resulted in a useful increase in our knowledge of the distribution of this group, notably of *Acilius canaliculatus* Nic. from Skipwith, *Agabus affinis* Payk. from Strensall and *Ilybius subaeneus* Er. from Haw Park Canal, all little-known species in the county.

The following collectors, in addition to the writer, are indicated by initials: Jeremy D. H. Flint, J. H. Flint, F. Hawkin, C. Johnson, P. Skidmore, D. E. Whittaker.

Carabus nitens L. (64) Dallowgill Moor, 17/4/67; E.W.A.

* *Dyschirius politus* Dej. (62) Strensall Common, 29/4/67; H.E.F.

* *Trechoblemus micros* Hbst. (63) Denaby Ings, in flood refuse, 16/5/67; F.H.

* *Agabus affinis* Payk. (62) Strensall Common, 2/8/67, soft example swept; J.H.F. and 10/67 abundant, J.D.H.F.

* *Ilybius subaeneus* Er. (63) Haw Park Canal, 6/5/67; J.D.H.F.

* *Acilius canaliculatus* Nic. (61) Skipwith Common, 10/6/67 and 2/9/67; J.D.H.F.

* *Hydraena brittani* Joy (64) Askham Bog, 3/4/65; E.W.A.

* *Cercyon convexiusculus* Steph. (64) Askham Bog, 1/5/60; E.W.A.

Leptinus testaceus Mull. (62) Helmsley, 17/2/67, in mole's nest; A. Gordon.

* *Agathidium seminulum* L. (62) Langdale End, 28/10/66; D.E.W.

* *Calyptomerus dubius* Marsh. (64) Copgrove, 12/7/67; E.W.A.

Euthia scydmaenoides Steph. (64) Copgrove, 12/7/67; C.J.

* *Acrotrichis stomaria* Deg. (63) Warp Farm, Thorne, 12/6/66; E.W.A.

* *A. danica* Sundt. (63*) Oaklands, Huddersfield, 10/11/45; E.W.A.: Stocks Moor Reserve, 24/2/66; E.W.A. (62*) Throxenby Mere, 26/6/66; E.W.A.

† *A. henrici* Matth. (63) Denaby Ings, 15/3/66; C.J., E.W.A. The first British specimens.

- †*A. insularis* Mak. (63) Roche Abbey, 27/10/65; C.J.: Farnley Moor, 25/4/66; E.W.A. (64*) Copgrove, 12/7/67; C.J. The first British specimens.
- **A. intermedia* Gyll. (64) Copgrove, 12/7/67; C.J.
- **A. montandoni* All. (64) Copgrove, 12/7/67; C.J.
- †*A. norvegica* Str. (64) Studley, 6/7/66; C.J.: Copgrove, 12/7/67; C.J.
- †*A. strandi* Sundt. (64) Askham Bog, W. D. Hincks: *loc. cit.*, 15/6/66; E. W. A. (62*) Throxenby Mere, 26/6/66; E.W.A. The first British specimens.
- **Ptiliolum kunzei* Heer. (64) Malham, 6/7/67; C.J.
- **Ptinella aptera* Guer. (64) Copgrove, 12/7/67; C.J.
- **P. denticollis* Fair. (64) Copgrove, 12/7/67; C.J.
- **Pseudopsis sulcata* Newm. (64) Copgrove, 12/7/67; E.W.A.
- †*Xylostiba monilicornis* Gyll. (63) Stockmoor Reserve, 4/11/66; E.W.A. A Scottish species no doubt introduced in timber.
- †*Lathrobium fovulum* Steph. (64) Askham Bog, 10/2/67, in mole's nest: E.W.A.
- **Heterothops dissimilis* Grav. (64*) Copgrove, 12/7/67; E.W.A. (63*) Dalton, Huddersfield, 3/10/48: Farnley Tyas, 30/12/59; E.W.A.
- H. praevia* Er. (64) Copgrove, 12/7/67; C.J. The first Yorkshire record for many years.
- Quedius xanthopus* Er. (62) Helmsley, 2/10/62; E.W.A.
- **Mycetoporus clavicornis* Steph. (61*) Skipwith Common, 17/5/65; E.W.A. (62*) Copgrove, 12/7/67; C.J.
- **Habrocerus capillaricornis* Gr. (64) Sleningsford Park, 1/4/67: Copgrove, 12/7/67; E.W.A.
- **Leptusa fumida* Er. (64) Copgrove, 12/7/67; C.J.
- †*Atheta alpestris* Heer. (64) Penyghent, 6/7/67; C.J.
- **A. melanocera* Thoms. (64) Sawley, 16/4/67; E.W.A.: Askham Bog, 25/4/67; C.J.
- **A. obtusangula* Joy (63) Gunthwaite, 1948; E.W.A.: Sawley, 15/4/67; E.W.A.
- **A. nigricornis* Thoms. (63) Stockmoor Reserve, 9/5/67; E.W.A.
- †*A. harwoodi* Will. (63) Stockmoor Reserve, 9/5/67, in carrion; E.W.A.
- **A. sodalis* Er. (64) Askham Bog, 10/2/67, in mole's nest; E.W.A.
- †*A. nidicola* Johan. (62) Dalby Forest, 10/66, in sparrow-hawk's nest; G. Simpson (64*) Askham Bog, 20/4/67; C.J.
- **A. hypnorum* Kies. (64) Askham Bog, 20/4/67; C.J.
- **A. longicornis* Grav. (63) Shepley, 30/4/67, in pig dung; E.W.A.
- †*A. pygmaea* Grav. (64) North Stainley, 1/4/67; E.W.A.
- †*A. subsinuata* Er. (64) North Stainley, 1/4/67; E.W.A.
- **Oxyptoda haemorrhoea* Mann. (64) North Stainley, 1/4/67; E.W.A.
- †*O. nigricornis* Mtsch. (64) Malham, 13/9/67; C. J. A montane species recently added to the British list.
- **Ocalea picata* Steph. (64) Sawley, 15/4/67; E.W.A.
- **Ocyusa maura* Er. (64) Penyghent, 6/7/67; C. J.
- Lampyrus noctiluca* L. (62) Langdale Valley, May, 1964; D.E.W. The glow-worm has been recorded rarely in recent years.
- **Korynetes caeruleus* DeG. (63) Sprotborough, 29/5/67; R. Crossley.
- †*Triplax russica* L. (63) Hatfield Moors, 5/1967: Thorne Waste, 25/6/67; P.S.
- **Atomaria lewisi* Reitt. (61) nr. Barmston, 13/7/67; E.W.A.
- **A. prolixa* Er. (63) Secker, 8/5/67; F.H.
- **A. munda* Er. (63) Bradley, nr. Huddersfield, 12/4/67; E.W.A.
- **Synchita humeralis* F. (63) Hatfield Moors, 5/67, one on *Daldinia*; P.S.
- **Harmonia quadripunctata* Pont. (63) Low Farm, Armthorpe, 12/8/67; P.S.
- **Hypophloeus unicolor* Pill. & Mitt. (61) Skipwith, 4/7/67, under birch bark; P.S.
- Hoplia philanthus* Fuess. (64) Kettlewell, 29/6/66; M. Brook. An uncommon species in Yorkshire.
- Eremotes ater* L. (62) Langdale Valley, 1966; D.E.W.
- Dorytomus longimanus* Forst. (63) Armthorpe, 6/67, on Lombardy poplar; P.S.

Hemiptera (J. H. Flint): This has not been an outstandingly productive year but there are some interesting additions to the county list and a very welcome increase in the number of records from V.C. 63 as a result of the work of Mr. Crossley. Some of the outstanding species have been taken in well-known haunts, Spurn, Skipwith Common, Thorne and Hatfield, but there is an interesting series of records from the disused canal at Haw Park near Wakefield and from a pond near Langsett. Neither

the canal nor the Langsett pond appear to have been investigated before and it is clear that while there is more to find in even the most thoroughly explored places such as Spurn, the search for new areas of interest can be amply rewarding.

There are four species to add to the county and eleven to the vice-county lists. Initials are those of the recorder and Mr. R. Crossley.

HETEROPTERA

- **Acompus rufipes* (Wolff) (63) Wilthorpe Marsh, Barnsley, 25/8/67; R.C. Haw Park, 8/10/67; R.C.
- †*Chlamydatus saltitans* (Fall.) (61) Spurn, brachypters and a macropterous female on the dried salt-marsh, 18/6/67; Mrs. H. E. Flint.
- Herotocordylus tibialis* (Hahn) (63) Blaxton, 15/7/67; R.C.
- **Neomecomma bilineatus* (Fall.) (63) Haw Park, on aspen, in abundance, 8/67; J.H.F.
- Lygus pratensis* (L.) (62) Cornelian Bay, Scarborough, 23/8/60; J.H.F. (64) Queen Mary's Dubbs, Ripon, 25/6/55; W. D. Hincks (det. J.H.F.).
- †*L. punctatus* (Zett.) (65) Swinton Park, Masham, 11/10/47; W. D. Hincks (det. J.H.F.).
- **Megaloceraea recticornis* (Geoff.) (62) Cayton Bay, 8/58; J.H.F.
- **Teratocoris viridis* D. & S. (63) Cupwith Hill, Huddersfield, at 1,400 ft. on sedges, 13/7/66; R.C.
- Salda morio* Zett. (63) Cupwith Reservoir, Huddersfield, commonly at 1,250 ft. 17/7/67; R.C.
- Saldula scotica* (Curt.) (63) Little Don, Langsett, 30/7/67; R.C.
- †*Hebrus ruficeps* (Thoms.) (61) Skipwith Common, in *Sphagnum*, 24/3/67; P.S.
- Hydrometra stagnorum* (L.) (63) Canal at Haw Park, 23/9/67; Jeremy D. H. Flint.
- Microvelia reticulata* (Burm.) (63) Canal at Haw Park, in abundance 8/10/67; P.S.
- **Notonecta maculata* F. (63) Quarry pond at Langsett, 26/2/67 and subsequently, in company with *N. obliqua* Gall. and *N. glauca* L.; P. Skidmore and R. C.
- **Micronecta poweri* (D. & S.) (63) Cannon Hall Park, Barnsley, 1/7/67; R.C. Previously recorded from here, 18/6/50, (*Naturalist*, 1964: 23) as *M. scholtzi* (Fieb.) in error.
- **Arctocoris germari* (Fieb.) (63) Cupwith Reservoir, Huddersfield, 25/9/67; R.C.
- Sigara distincta* (Fieb.) (61) Huggate, 10/6/67; R.C.
- S. falleni* (Fieb.) (63) Newmillerdam Lake, 20/5/67; Jeremy D. H. Flint.
- S. limitata* (Fieb.) (61) Huggate, 10/6/67; R.C.
- **S. semistriata* (Fieb.) (64) Barlow, near Selby, 7/3/67; J.H.F.

HOMOPTERA

- Eurhadina loewi* (Then) (64) Meanwood Valley, Leeds, 9/67; J.H.F. Only the second locality found in Yorkshire. The colony originally found in Gledhow Valley, Leeds, is still thriving.
- †*Chloriona dorsata* Edw. (61) Spurn, 18/6/67; J.H.F. Apparently recorded from only three other places in Britain.
- **Ditropis pteridis* (Spin.) (63) Thorne Waste, 25/6/67; J.H.F.
- **Griomorphus albomarginatus* Curt. (61) Spurn, 18/6/67; J.H.F.

Hymenoptera (J. H. Flint): Collecting trips have not been very successful this year but insufficient work has been done to attribute this to a scarcity of insects. Some of the arrears of identification were cleared during winter months so this report consists in large part of records from past seasons' collecting. Material has been received from Mr. M. T. Brooks, Mr. R. Crossley and Mr. C. I. Rutherford but most of the species listed here have been collected by my wife (H.E.F.) or myself. I am responsible for the determinations.

SYMPHYTA

- **Cephus cultratus* Evers. (62) Strensall Common, 31/5/64; J.H.F.
- **Strongylogaster macula* (Klug) (64) Lindley Wood, Washburn Valley, 25/5/60; H.E.F.
- †*Aneugmenus furstenbergensis* (Konow) (64) Lindley Wood, 29/5/60; H.E.F.
- **Dolerus pratensis* (L.) (63) Gunthwaite, 3/6/66; R.C.

- **Monosoma pulverata* (Retz.) (64) Askham Bog, 18/5/60; Mrs. J. Payne.
- †*Empria excisa* (Thoms.) (64) Golden Acre, Leeds, 7/6/62; J.H.F.
- **Allantus calceatus* (Klug) (63) Thorne Waste, 3/6/62; H.E.F.
- **Ardis brunniventris* (Hart.) (62) Cayton Bay, 16/8/61; J.H.F.
- **Halidamia affinis* (Fall.) (64) Breary Marsh, Leeds, 28/5/63; J.H.F.
- **Tenthredopsis excisa* (Thoms.) (61) Allerthorpe Common, 10/6/67; J.H.F.
- **Hoplocampa crataegi* (Klug) (63) Haw Park, near Wakefield, 29/5/67; J.H.F.
- **Pristiphora crassicornis* (Hart.) (64) Shadwell, Leeds, 27/7/63; J.H.F.
- **Amauronematus histrio* (Lep.) (64) Shadwell, Leeds, bred from larvae taken on *Salix fragilis*, emerged 6/6/62; J.H.F.
- **A. viduatus* (Zett.) (62) Strensall Common, 28/4/64; J.H.F.
- **Pontania collectanea* (Forst.) (61) Skipwith Common, typical galls on the leaves of *Salix repens*, 2/9/67; H.E.F.
- †*Nematus hypoxanthus* Forst. (64) Shadwell, Leeds, 27/7/63; J.H.F.
- †*N. incompletus* Forst. (64) Hubberholme, 16/6/64; H.E.F.
- †*N. salicis* (L.) (64) Fairburn Ings, 9/6/63; H.E.F.

ACULEATA

- **Anoplus fuscus* (L.) (62) Strensall Common, 30/4/66; J.H.F.
- **A. concinnus* (Dahl.) (61) Skipwith Common, 7/67; J.H.F.
- **Ancistrocerus antilope* (Pz.) (64) Harrogate, 3/6/66; C.I.R.
- **Crossocerus pubescens* (Shuck.) (63) Thorne Waste, 25/6/67; J.H.F.
- †*Rhopalum coarctatum* (Scop.) (63) Thorne Waste, 25/6/67; J.H.F.

Diptera (P. Skidmore): The Diptera remain a relatively unworked group in our area and hence it is possible to be able to report a fair number of new county and vice-county records (17 and 47 respectively). Some of the records hail from earlier years when the writer was living in Lancashire and collecting in the Slackcotes valley between Delph and Denshaw (V.C. 63). We are indebted to all who have submitted their records but especially to Mr. L. N. Kidd, of Werneth Park Study Centre, Oldham, for his records of Mycetophilidae collected at Sandall Beat Wood, Doncaster, on 9/10/67: others to whom thanks are offered for their records are Messrs. A. G. Boulton, R. Crossley, C. Devlin, and C. I. Rutherford. Specimens collected by Messrs. Boulton, Devlin and Skidmore have been incorporated into the collections of the Doncaster Museum and Art Gallery.

- **Phalacrocerca replicata* (L.) (63) Abundant every year in the dam at Linfitts, Slackcotes valley: 1♂ Thorne Waste, 25/6/67; P.S.
- **Bolitophila hybrida* (Mg.) (63) Several males at Sandall Beat Wood; L.N.K.
- **Macrocera vittata* (Mg.) (63) 1♂ 1♀ Sandall Beat Wood; L.N.K.
- **Mycomya winnertzi* (Dziedzicki) 1♂ Sandall Beat Wood; L.N.K.
- **M. hyalinata* (Mg.) (63) 1♂ Sandall Beat Wood; L.N.K.
- **M. cinerascens* (Mcq.) (63) 1♂ Sandall Beat Wood; L.N.K.
- **M. incisurata* (Zett.) (63) 1♀ Sandall Beat Wood; L.N.K.
- **M. flava* Stannius (63) Both sexes common at Sandall Beat Wood; L.N.K.
- **Acnemia nitidicollis* (Mg.) (63) 1♀ Sandall Beat Wood; L.N.K.
- **Boletina trivittata* (Mg.) (63) 1♀ Sandall Beat Wood; L.N.K.
- †*Synapha vitripennis* (Mg.) (63) 1♂ Sandall Beat Wood; L.N.K.
- **Tetragoneura sylvatica* (Curtis) (63) 1♀ Sandall Beat Wood; L.N.K.
- †*Exechia fusca* (Mg.) (63) Several of both sexes at Sandall Beat Wood; L.N.K.
- †*E. nana* (Staeger) (63) 1♂ Sandall Beat Wood; L.N.K.
- **E. contaminata* Winnertz (63) ♀♂ Sandall Beat Wood; L.N.K.
- **E. subulata* Winnertz (63) 1♀ Sandall Beat Wood; L.N.K.
- **Allodia lugens* (Wiedemann) (63) 1♂ Sandall Beat Wood; L.N.K.
- **A. oranticollis* (Mg.) (63) 1♂ Sandall Beat Wood; L.N.K.
- **A. griseicollis* (Staeger) (63) 1♂ Sandall Beat Wood; L.N.K.
- **Brachypeza helvetica* (Walker) (63) 1♀ Sandall Beat Wood; L.N.K.
- †*Cordyla flaviceps* (Staeger) (63) 1♂ Sandall Beat Wood; L.N.K.
- **Mycetophila fungorum* (DeG.) (63) 1♀ Sandall Beat Wood; L.N.K.
- **M. guttata* Dziedzicki (63) Several of both sexes at Sandall Beat Wood; L.N.K.
- **Bolitophila hybrida* (Mg.) (63) Several males at Sandall Beat Wood; L.N.K.
- **Beris clavipes* (L.) (63) A common insect in bushy places; Slackcotes, Gunthwaite, Doncaster; P.S.

- Symphoromyia crassicornis* (Panzer) (63) Mainly a moorland species, this fly is frequent in Slackcotes in June most years; 2♂ Wilthorpe Marsh, near Barnsley, 3/7/67; P.S., R.C.
- Scenopinus fenestralis* (L.) (63) This fly occurs periodically on the windows in Doncaster Museum & Art Gallery.
- † *Tachytrechus notatus* Stannius (63) 1♂ 1♀ Denaby Ings, 26/8/67; P.S., A.G.B.
- Xylota xanthocnema* Collin (63) 1♀ Edlington Wood, 18/6/66; C. I. Rutherford. One previous Yorkshire record (*Naturalist*, 1966; 18)
- * *Physocephala rufipes* deGeer (63) One swept from edge of scrubland at Haw Park, 8/67; R.C. Only recorded singly from V.C. 61 and 62.
- Melieria crassipennis* Fabricius (63) A common species in the marshes of the lower reaches of the Dearne and the Don. Several at Wilthorpe Marsh near Barnsley on 3/7/67; P.S., R.C.
- * *Ceroxys urticae* (Linnaeus) (63) Frequent in old marshes with the previous species:—Adwick-le-Street, summer 1965; H. E. Beaumont. Denaby Ings, frequent in June and July 1966 and 1967; C.J.D., P.S. Wilthorpe Marsh, 3/7/67; P.S., R.C.
- * *Chyliza leptogaster* (Meigen) (63) 1♂ Auckley, 24/5/67; 1♀ Hooton Roberts, 8/7/67; P.S.
- † *Minettia longipennis* (Fabricius) (63, 64) A fairly common species in woodlands; specimens in Doncaster Museum from Hooton Roberts, 8/7/67; Copgrove Park (64), 14/7/67, and Wilton Park, Batley, 11/8/67; P.S.
- * *Pherbellia* (= *Sciomyza*) *albocostata* (Fallen) (63) A common species in woods amongst Dogs Mercury and Nettles, mainly on light or basic soils. Roche Abbey, Denaby Ings, Cadeby; P.S., C.J.D.
- * *P. scutellaris* (von Roser) (63) 1♂ Sprotborough, 17/7/67; 1♂ Sandall Beat Wood, 9/10/67; P.S.
- * *Phaeomyia fuscipennis* (Meigen) (63) Frequent amongst lush vegetation growing on light soils, especially in woods; Cadeby, Roche Abbey, Denaby Ings; P.S., C.J.D.
- * *Trypetoptera punctulata* (Scopoli) (63) Frequent in bushy places on the magnesian limestone belt of V.C. 63; Sandbeck, Roche Abbey, Cadeby, Edlington Wood; P.S., C.J.D.
- * *Limnia rufifrons* (Fabricius) (63) Frequent in bushy places mainly on the magnesian limestone in V.C. 63; specimens in Doncaster Museum collection from Rossington Bridge, 15/7/65; P.S.
- † *Heteropteryx brevipennis* (Zetterstedt) (63) 1♂ Denaby Ings, 26/8/67; C.J.D.
- * *Elgiva cucularia* (Linnaeus) (63) Frequent at Denaby Ings, Potteric Carr, Hatfield Moors, Blaxton Common; P.S., C.J.D. Mainly in old marshes.
- * *Helomyza* (= *Stullia*) *variegata* Loew. (63, 65) A common fly of damp shady woods; Roche Abbey, Sandall Beat Wood, Denaby Ings, Cadeby, Sprotborough, and High Force in Teesdale (65); P.S.
- * *H. notata* v. *hilaris* Zetterstedt (63, 65) By far the commonest large Helomyzid in northern England. In damp shady woods, Slackcotes, Roche Abbey, Cawthorne, Gunthwaite, Denaby Ings, Cadeby, Sandall Beat; P.S.
- * *H. ustulata* Meigen (63) A fairly common and distinctive large dark species of shady woods; Sandall Beat Wood, Roche Abbey, Cadeby; P.S.
- * *H. humilis* Meigen (63) Much more local than the preceding species but in similar situations; 1♂ 1♀ Sandall Beat Wood, 9/10/67, others seen; P.S.
- † *H. infera* Collin (65) Common in the Grampians this fly is only known in England from the Teesdale-Crossfell area of the northern Pennines; several taken at High Force, 20/9/65; P.S.
- † *Tephrochlamys tarsalis* (Zetterstedt) (63) Usually found in birds' nests, a single male of this species was beaten from a hawthorn hedge near Hatfield on 2/7/65; P.S.
- † *Neoleria ruficauda* (Zetterstedt) (63) 3♀ High Force, Teesdale, 20/9/65; P.S. Taken from Fly Agaric (*Amanita muscaria*).
- * *N. inscripta* (Meigen) (63) A common fly which breeds in carrion—probably throughout the county—Slackcotes, Gunthwaite, Sandbeck, Roche Abbey; P.S.
- * *Morpholeria ruficornis* (Meigen) (65) 1♂ High Force, 20/9/65; P.S.
- † *Anthomyza bifasciata* Wood (63) 1♂ Blaxton Common, 15/7/67; P.S. A very striking little fly, this is only recorded in the literature from the type locality in Herefordshire. On the Continent it is thought to be associated with *Typha* and indeed the above specimen was swept from this plant.

- †*Phaonia atriceps* Loew (63) This fly is associated with *Typha* and *Glyceria* and should be sought wherever these plants abound. Previously considered an extreme rarity, it appears that this fly is locally common. Adults reared from puparia found in *Typha* at Potteric Carr and Blaxton Common in spring 1967 and adults found in great abundance at Denaby Ings on 26/8/67; P.S.
- **P. trigonalis* Meigen (= *laetabilis* Collin) (64) 1♀ Copgrove Park, 14/7/67; P.S. Collin (*Ent. Rec.* 1949: 63: 2.) mentions a Yorkshire record without further data, but this record is not on the Yorkshire Card Indexes of Cheetham and Fordham.
- †*Mydaea detrita* (Zetterstedt) (61) 2♂ Skipwith Common, 4/7/67; P.S.
- †*Schoenomyza litorella* (Fallen) (63) Generally abundant in Slackcotes Valley; P.S.
- **Eustalomyia histrio* (Zetterstedt) (61) Several on birch trunk at Skipwith Common, 4/7/67; A. G. Boulton.
- **Lipara lucens* Meigen (63) Galls of this species were collected from Torne bridge and Potteric Carr during spring of 1967 and adults were reared. A characteristic fly of old fens, this fly was previously only known in Yorkshire from V.C. 61 and 64; P.S.
- †*Megaphthalma pallidum* (Fallen) (63) 1♂ Slackcotes Valley; P.S.
- **Scatophaga lutaria* Fabricius (63) A very common dung fly in most places, though less frequent in open moorlands. Throughout V.C. 63, Slackcotes, Gunthwaite, Cawthorne, Roche Abbey, Thorne Waste, Hatfield Moors, Denaby Ings, Potteric Carr; P.S.
- **S. squalida* Meigen (63) Another common species but this one is dominant in the higher parts of the Pennines. Less common in lowland areas.
- †*Amaurosoma flavipes* (Fallen) (63) Common at Denaby Ings, first collected on 8/6/66 and noted often since; P.S., C.J.D.
- †*A. armillatum* (Zetterstedt) (63) With previous species.
- **Epicamprocera succincta* (Meigen) (63) Frequent at Slackcotes in August; P.S.
- **Paraphrocera stabulans* (Meigen) (63) Generally common: Slackcotes, Edlington Wood, Barnby Dun; P.S. Denaby Ings; C.J.D.
- **Thelaira leucozona* (Panzer) (63) Generally common: Slackcotes, Roche Abbey; P.S. Old Denaby; C.J.D.
- **Phyllomya volvulus* (Fabricius) (63) Common in woodlands east of the Pennines where chafer beetles occur: Edlington Wood, Cadeby, Sprotborough, Sandall Beat Wood, Roche Abbey, Cawthorne; P.S.
- **Tachina rustica* Fallen (63) 1♂ Hatfield, 11/7/65; T. M. Clegg.
- **Nemorilla floralis* (Fallen) (63) 1♂ Potteric Carr, 12/8/65; P.S.
- **Anachaeopsis zetterstedti* Ringdahl (63) 1♀ Rossington Bridge, 15/7/63; P.S.
- **Macquartia tenebricosa* (Meigen) (63) 2♂ 1♀ Rossington Bridge, 15/7/65; P.S.
- **Sarcophaga frenata* Pandelle (63) Several at Potteric Carr, 5/8/65; P.S.
- **Cynomyia mortuorum* (Linnaeus) (63) Sparingly most years at Slackcotes in summer; P.S.
- **Acrophaga subalpina* (Ringdahl) (63) Frequent in woodlands: Slackcotes, Potteric Carr, Roche Abbey, Sandall Beat Wood, Cadeby and Sprotborough, Denaby Ings; P.S.

Lepidoptera (S. M. Jackson): Once again I must report a rather poor season. In spite of a good summer, many species were down in numbers, possibly the chief reason being the mild winter of 1966-7 followed by a cool spring. In particular, it has been a poor year for migrants and I have no report of either the Painted Lady or Clouded Yellow butterflies. There have also been fewer contributors this year, so my thanks are due to the following for their records the more important of which are listed below; J. Armitage, J. Briggs, J. H. Flint, C. R. Haxby, A. M. R. Heron, W. Jagger, E. Richards, G. Simpson, P. Skidmore, C. C. Smith, P. G. Tannett and P. Winter.

Euchloe cardamines L. (Orange Tip) About the usual numbers seen in the Selby district; S.M.J. (62) Pickering, 29/5/67; G.S. A few near Lake Gormire, 10/6/67; S.M.J. (64) Micklefield, 6/67; S.M.J.

Argynnis aglaia L. (Dark Green Fritillary) (62) Gundale, several 22/7/67; S.M.J.

A. euphrosyne L. (Pearl-bordered Fritillary) (62) Newtondale, 6/67; E.R. It has been a poor year for this species which appears to be getting scarcer. In three localities which I (S.M.J.) visited in June and where it used to abound, I did not see a single insect.

- A. selene* Schiff. (Small Pearl-bordered Fritillary) (62) Still persisting on Skipwith Common, 18/6/67; S.M.J.
- Nymphalis io* L. (Peacock) Appears to have had a very poor year, the only records which I have being of single insects. (61) Ellers Wood, 14/4/67; G.S. (62) Muston, Filey, 11/9/67; P.W. (64) near Selby, 8/67; S.M.J.
- Vanessa atalanta* L. (Red Admiral) Very scarce this year. Several members report odd insects only although several were seen in the Scarborough area by P.W.
- Maniola tithonus* L. (Gatekeeper) (63) Present in some quantity in the Thorne area, 8/8/67; A.M.R.H.
- Strymonidia w-album* Knoch (White-letter Hairstreak) (61) Larvae beaten from Wych Elm near Malton, 29/5/67; S.M.J.
- Lycaena phlaeas* L. (Small Copper) A very poor year for this species, the numbers observed being down everywhere.
- Arica agestis* Schiff. (Brown Argus) (62) A few noted in Gundale, Pickering, 17/6/67; S.M.J. Plentiful in the same locality, 22/7/67; J.A. (64) Widespread round Grass Wood and Dib Scar, 25/7/67; J.B.
- Pyrgus malvae* L. (Grizzled Skipper) (61) Noted again on railway banks at South Cave; E.R.
- Acherontia atropos* L. (Death's Head Hawk) (63) One taken at East Bierley, Bradford, 11/9/67, by J.B., is the only record I have.
- Herse convolvuli* L. (Convolvulus Hawk) (63) One caught in car radiator near Batley, 11/9/67; J.B.
- Cerura furcula* L. (Sallow Kitten) (62) Hackness, 5/7/67; P.W.
- Thyatira batis* L. (Peach Blossom) Although this pretty moth turns up, often commonly, where a light is operated in the more sylvan districts it is rather rare in the industrial areas. (63) Birkenshaw, Bradford, one 12/7/67; W. J. (J.B.).
- Tethea ocularis* L. (Figure of Eighty) (61) I first took this moth at Skipwith in 1965, my most northerly record. I was pleased to take the larva in the same locality this year; S.M.J.
- Earias clorana* L. (Green Pea) Since this insect was discovered by A. Steel in the Thorne area in 1962 it has been found to be more widespread than was originally thought. Larvae were found again this year in three separate localities in that region, 8/8/67; A.M.R.H.
- Nudaria mundana* L. (Muslin Footman) (64) Timble, 31/7/67; P.G.T. Rather local and probably overlooked.
- Apatele alni* L. (Alder) (64) Larva on Alder, Breary Marsh, Leeds, 22/8/67; C.C.S.
- A. tridens* Schiff. (Dark Dagger) (62) Larva taken at Muston, Filey, 9/67; P.W.
- Lycophotia varia* Vill. ('True Lovers' Knot) (62) Muston, Filey, several 7/67; P.W. This common, exclusively heather-feeding moth continues to confound us by its habit of turning up at lights often miles from its normal heathy habitats. The present record is an example.
- Amathes depuncta* L. (Plain Clay) (62) Hackness, 8/8/67, a single moth taken at M.V. light; P.W. Rare in Yorkshire.
- A. stigmatica* Hubn. (Square Spot Clay) (62) Hackness, one taken at M.V. light, 8/8/67; P.W. This is the first record known to me for fifty years and one of the most important captures of the year.
- Hadena conspersa* Esp. (Marbled Coronet) (64) Chapel Allerton, Leeds, 6/67, to light; J.H.F. Headingley, Leeds, 1/7/67; C.C.S.
- Bombicia viminalis* F. (Minor Shoulder Knot) (64) Askham Bog, larvae on sallow, 2/6/67; C.C.S. The moth, which comes readily to light, is of the dark form. A local species in Yorkshire.
- Apamea ipsilon* Borkh. (Dingy Shears) (64) Selby Common, larvae behind bark of old willows; S.M.J.
- Gosmia affinis* L. (Lesser Spotted Pinion) (61) Malton, larvae beaten from elm, 29/5/67; S.M.J. Muston, Filey, one adult at light, 8/67; P.W.
- Agrochola lychnidis* Schiff. (Beaded Chestnut) (63) Birkenshaw, Bradford, four came to light, 3-8/67; W.J. Although a common insect in many parts of the county, it is rare in the industrial west.
- Conistra ligula* Esp. (Dark Chestnut) (61) Near Beverley, several at ivy bloom, 5/10/67; P.W. (62) Near Scarborough, at ivy bloom, 14/10/67; S.M.J.
- Zanclognatha nemoralis* F. (64) Selby, in garden, 7/67; S.M.J. Headingley, Leeds, at light 16/7/67; C.C.S.

- Odezia atrata* L. (Chimney Sweeper) Although very local and usually common enough where it does occur this moth is not often reported. (64) Bolton Abbey, a good colony, 29/6/67; A.M.R.H. Breary Marsh, very common, 2/7/67; C.C.S. Askham Bog, a few, 12/7/67; C.C.S.
- Nothopteryx carpinata* Borkh. (Early Tooth Stripe) (62) Forge Valley, Scarborough, frequent 6/67; P.W. A very local species in the county.
- Thera firmata* Hubn. (Pine Carpet) (62) Strensall, 27/8/67; C.C.S.
- Xanthorhoe spadicearia* Schiff. (Red Twin-Spot Carpet) (62) Hackness, and Muston, Filey, single examples, 8/8/67; P.W.
- Perizoma albulata* Schiff. (Grass Rivulet) (63) Little Horton, Bradford, at M.V. light, 12/7/67; J.B. (64) Selby Common, several 6/67, the first I have seen in the area for many years; S.M.J. Micklefield, on a hillside, 6/67; S.M.J.
- P. minorata* Treits. (Heath Rivulet) (64) Although C. I. Rutherford found this species abundantly at Dib Scar, Grassington, last year, J.B. and C.R.H. failed to note more than one or two on several visits last August.
- Eupithecia haworthiata* Doubl. (Haworth's Pug) (63) Larvae found in a new locality near Wentbridge where there is a surprising abundance of the food plant, *Clematis vitalba*; S.M.J.
- E. fraxinata* Crewe (Ash Pug) (63) Wentbridge, larvae, 22/7/67; S.M.J. Little Horton, Bradford, adult at M.V. light, 10/7/67; J.B.
- E. exigua* Hubn. (Mottled Pug) (64) Askham Bog, larvae on hawthorn, 9/66 and 2/6/67; S.M.J.
- E. pini* L. (Cloaked Pug) (63) A single specimen, a large female, was taken by C. Denham at M.V. light at Bolton, Bradford, 14/6/66, and exhibited at the S. Lond. Ent. Nat. Hist. Soc. Exhibition, 28/10/67; C.R.H. There is some implied doubt in Porritt's reference to the single Yorkshire record of the last century and the origin of the present insect is also in doubt. Possibly it was introduced as ovum or pupa with spruce cones. It is, however, the only fully authenticated record I have.
- Chiasmia clathrata* L. (Latticed Heath) (63) Thorne Waste, 5/6/67; J.H.F. (64) Malham Tarn, two in moth trap, 21/7/67; J.B. Micklefield, on railway embankment, 6/67; S.M.J.
- Selenia lunaria* Schiff. (Lunar Thorn) (64) Grass Wood, 18/6/67; J.B. and C.R.H. Not very common in the district.
- Cataclysta lennata* L. (63) Wilthorpe, several in canal, 2/7/67; Potteric Carr, 4/8/67; P.S.
- Nymphula nymphaea* L. (63) Hooton Roberts, abundant in fish ponds, 8/7/67; P.S.
- Pyralis farinalis* L. (63) Armthorpe, 12/8/67; P.S.
- Crambus uliginosellus* Zell. (63) A single example on Hatfield Moors, late 5/67; A. G. Boulton (P.S.). Only the second Yorkshire record, the first being from Skipwith, 1895.
- C. perlellus* Scop. (63) Hatfield Moors, several, 15/7/67; P.S.
- C. inquinatellus* Schiff. (63) Potteric Carr, several, 9/8/67, and Denaby Ings, 26/8/67; P.S.
- Nemotois degeerella* L. (63) Hatfield Moors, numerous in small wood, 1/7/67; P.S.
- Adela rufimitrella* Scop. (63) Sandall Beat Wood, Doncaster, one, 24/5/67; P.S.
- Cossus cossus* L. (Goat) (65) Dishforth, one at M.V. light, 2/8/67; P. Kay (J.B.). Not often reported.

BOTANY

(Dorothy R. Walker): All reporters comment on the mildness of the winter with an absence of snow and frost. The mild January and February were responsible for some early records of flowering such as Lesser Celandine in the Middlesbrough area on 6th February and Primroses in Grass Woods on 5th March; but thereafter most reports agree that flowering was retarded by the cold weather and high winds of April and May.

From the East Riding it is reported that some species normally flowering in June and July were two to three weeks late in doing so this year. This applied to *Lathyrus palustris*, *Dactylorhiza incarnata*, *Orchis apifera* and *Linum anglicum*. One or two species however flowered early, *Thalictrum flavum* for instance being in full flower by the River Hull on 14th June. Aquatic plants were luxuriant by the waterways of the River Hull valley possibly due to heavy rain early in the season washing fertilisers into

the drains and river, combined with warm conditions throughout much of the summer. Long periods of warmth and an abundance of water in the soil may account for many chalk-wold species continuing to flower in late August and well into September; *Centaurea scabiosa* was still in good flower on 16th September and flowers of Stemless Thistle on 22nd September.

Further north, around Thirsk, after the late spring, flowering is reported to have been poor in many species. Laburnums which appeared to behave normally in other parts of the north, produced no flower at all. Horse Chestnuts flowered badly with only a few spikes on each of the reporter's 50 trees, none of which fruited. Apples were the worst crop for many years, Damsons and Pears failed and the Plum crop was very poor. Brambles flowered profusely as they appear to have done over most of the county but, disappointingly, the fruit crop was later than and well below average. Below average is also the summing up for the fruiting of Oak, Sycamore, Elm and Beech.

From Middlesbrough it is recorded that the cold March and April resulted in a poor showing of spring flowers but the warmer months of June and July brought an onrush of summer flowers, their season coming to an earlier end than usual. Garden flowers blossomed well this summer and in parks near the coast and the coastal regions generally there has been little evidence of damage by cold north-east winds blowing in during the summer months.

In upper Wharfedale, after the early setback caused by the cold and high winds, later flowering was good. In Grass Wood *Geranium sylvaticum* was conspicuous, *Serratula tinctoria* less so and *Hypericum montanum* had a poor season. *Galium boreale* was good on Dewbottom Scar.

From the Ilkley area the pattern of early flowering followed by a halt due to cold winds was repeated. Gorse, Broom, Sycamore, Oak, Hawthorn and Blackthorn all flowered well. Oak was in full leaf and some in flower before the first Ash leaves appeared. Some Sycamores started yellowing in the middle of August. Beech fruited and there were good crops of Hazel nuts.

From Otley it is reported that aquatic plants flowered freely in the lagoons. *Elodea canadensis* and *Myriophyllum spicatum* covered large areas with blooms above the water and Yellow Water-Lilies appeared and flowered well. One farmer began cutting hay in May and has had two lots of good hay and one crop — green for silage — from his four fields. The harvest of cereals has everywhere been good and the ploughing of cleared fields is well in hand. The recent emptying of the new Thruscross Reservoir has filled Fewston Reservoir to the brim and *Juncus filiformis* is now nearly all under water.

In the Bradford area, Horse Chestnuts are reported to have flowered poorly and apple crops were very poor, no doubt due to the wet and cold of May adversely affecting pollination. This certainly happened also in commercial tomato crops.

The report from Halifax states that the exceptionally mild winter allowed many plants to retain their foliage until very late and some normally tender plants survived the winter. Vegetation generally was retarded by the cold weather in April and the very wet May — the second wettest May on record there. From June onwards growth was normal though crops of most wild fruits were rather poor.

One tree not mentioned elsewhere in this report is the Lime. This is the tree most widely grown around all parts of Harrogate Stray where it flowered extremely well. The trees were heavy with blossom and later fruited equally well.

PLANT RECORDS: EAST RIDING (E. Crackles)

One of the most notable discoveries made in 1966 and not included in last year's report was *Carex polyphylla* found by Eric Chicken in Millington Wood. This is a new vice-county record. 1967 has been a most interesting year in East Yorkshire. The discovery of two localities for *Spiranthes spiralis* in the northern part of the wolds is of particular interest since the only previous mention of this species in the East Riding is in a manuscript herbal compiled by Rev. W. Whytehead while he was vicar of Atwick (1757-1817) which mentions the species as occurring on the coast at Atwick. Other records of note are for:— *Monotropa hypophaea*, near Elloughton; *Oenanthe fluviatilis* in the River Hull near Hempholme, this being a second vice-county record for this species; and the discovery of *Cirsium acaulon* in quantity in chalk grassland in two localities in the southern part of the wolds.

Contact has been made with two botanists in the Driffield area, Miss M. Taylor and Mr. J. Rushton, who have been active in the vice-county and who have provided

a very interesting list of localities for uncommon species; some of these are included in this report. In all, additional records for a large number of species which are rare or very local in East Yorkshire have been reported this year.

Ophioglossum vulgatum L. Nafferton, 1966; J. Rushton and M. Taylor (J.R. & M.T.).

Ranunculus parviflorus L. Near Driffield; J.R. & M.T.

Papaver lecoqii Lamotte Rudston; E. Chicken (E.Ch.).

Papaver argemone L. Near Knapton; Mrs. Houseman.

Viola hirta x *odorata* = *V. x permixta* Jord. Near Tibthorpe; E. Crackles (E.C.)

Sagina maritima Don Coast path at Kinsea; W. A. Sledge. Second East Yorks. record.

Malva neglecta Wallr. Driffield, 1964; J.R. & M.T.

Malva moschata L. Campdale, near Fordon and near Settrington; E.C.

Geranium columbinum L. Fordon; E.C.

Trifolium fragiferum L. Driffield, 1964; J.R. & M.T.

Astragalus danicus Retz. Langdale; J.R. & M.T.

Hippocrepis comosa L. Near Duggleby; Dr. D. Boatman.

Lathyrus montanus Bernh. Kexby, 1965; J.R. & M.T.

Aphanes microcarpa (Boiss. & Reut.) Rothm. Sandy track by Sands Wood, Winttringham; W. A. Sledge.

Myrrhis odorata (L.) Scop. Burton Fleming; E.Ch. Boynton; J.R. & M.T.

Pimpinella major (L.) Huds. Bridlington Priory; J.R. & M.T.

Oenanthe fluvialis (Bab.) Colem. In the River Hull at Hempholme lock; E.C.

Silaum silaus (L.) Schinz & Thell. North Grimston; E.C.

Bryonia dioica Jacq. Brandesburton; E.Ch.

Monotropa hypophaea Wallr. Near Elloughton; E.C.

Lysimachia nemorum L. Between Bentley and Beverley; E.C.

Anagallis tenella (L.) L. Thornwick Bay; J.R. & M.T.

Samolus valerandi L. Thornwick Bay, 1964 and Emmotland, 1964; J.R. & M.T.

Lactostomia perfoliata (L.) Huds. Near Cowlam; J.R. & M.T.

Lithospermum officinale L. Lowthorpe, 1964; J.R. & M.T.

Veronica polita Fr. Near Scrayingham; C. M. Rob.

Thymus pulegioides L. Near Wharram, near Duggleby, Sherburn and Risby; E.C.

Legousia hybrida (L.) Delarb. Near Staxton; E.C.

Galium saxatile L. Near Bentley; E.C.: this is a rare plant in E. Yorks. east of Derwentland.

Cirsium acaulon (L.) Scop. In quantity on a hillside in Drewton Dale; also on Beverley Westwood, confirming an old record; E.C.

Centaurea cyanus L. Burton Raikes; J.R.

Butomus umbellatus L. River Hull bank, near Baswick; E.C.

Juncus subnodulosus Schrank Between Bentley and Beverley; E.C.

Luzula pilosa (L.) Willd. Between Bentley and Beverley; E.C.

Epipactis palustris (L.) Crantz Near Driffield; J.R. & M.T.

Epipactis helleborine (L.) Crantz Kexby, 1965; J.R. & M.T. and near Bentley, the leaves of some plants being abnormally narrow; E.C.

Spiranthes spiralis (L.) Chevall. Near Staxton; A. Newton & E.C.: Fordon; E.C.

Gymnadenia conopsea (L.) R. Br. Near Ruston Parva; J.R. & M.T.

Dactylorhiza incarnata (L.) Vermeul. Great Givendale; E.C.

Lemna gibba L. River Hull, near Hempholme lock; E.C.

Scirpus lacustris L. River Hull bank at Hempholme lock; E.C.

Blysmus compressus (L.) Panz. ex Link Great Givendale; E.C.

Carex binervis Sm. Between Bentley & Beverley; E.C.

Carex pallescens L. Between Bentley and Beverley; E.C.

**Carex polyphylla* Kar. & Kir. (det. E. C. Wallace) Millington Wood, 1966; E.Ch.

Vulpia bromoides (L.) Gray On a wall between Bentley & Walkington; E.C.

Calamagrostis epigejos (L.) Roth Between Bentley & Beverley; E.C.

Milium effusum L. Between Bentley and Beverley; E.C.

WEST RIDING: (F. Murgatroyd)

Lycopodium clavatum L. (65) Cautley Crag, Sedbergh 34/69; D. J. Tennant. Not marked in Atlas though previously recorded from here.

Equisetum hyemale L. (64) South bank of Nidd near Bilton; G. A. Shaw & F. E. Branson. Confirmation of 1896 record (see *Suppl. Fl. Yorks.*, 123) and omitted from Atlas.

- Nuphar lutea* (L.) Sm. (64) Knotford Nook lagoon, Otley; Mrs. Houseman. Presumably introduced.
- Corydalis claviculata* (L.) DC. (64) Dallow Gill 44/17; D. J. T. Not marked in Atlas.
- Draba incana* L. (64) Foxup Moor on rocks by cave 34/87; D. J. T. Not marked in Atlas.
- Astragalus danicus* Retz. (64) Near South Milford; E. Thompson.
- Potentilla crantzii* (Crantz) G. Beck ex Fritsch (64) Foxup Moor on rocks by cave; D. J. Tennant. White square in Atlas.
- Alchemilla wickuriae* (Buser) Stefan. (64) Grass Woods and above Horton-in-Ribblesdale; D. J. Tennant.
- Rosa sherardii* Davies var. *omissa* (Déségl.) W.-Dod f. *resinosoides* (Crèp.) W.-Dod
R. villosa L. var. *mollis* Sm. f. *caerulea* Woods and *R. canina* L. var. *spuria* (Pug.) W.-Dod all det. Rev. G. G. Graham (64) Bramhope ponds; Miss R. Kilby and Mrs. Houseman.
- Drosera rotundifolia* L. (63) Erringdon Moor 34/92; Y.N.U. Excn. Not marked in Atlas.
- Myosotis sylvatica* Hoffm. (64) Healaugh & Wighill 44/44; T. F. Medd. Not marked in Atlas.
- Mentha* × *niliaca* Juss. ex Jacq. (64) Stockbridge House, Cawood; T. F. Medd.
- Carduus acanthoides* L. (63) Sowerby Bridge — introduced with soil, previously unknown in district; F. Murgatroyd.
- Hieracium oistophyllum* Pugsl. (64) Rocks near Colt Park wood; Mrs. Houseman.
- H. subcrocatum* (E. F. Linton) Roffey (64) Cray nr. Hubberholme; Mrs. Houseman.
- Lemna gibba* L. (63) Canal at Luddendenfoot, Halifax; F. Murgatroyd.
- The following species are unrecorded in their respective grid squares in the Atlas.
- 44/07 *Thelypteris phegopteris* (L.) Sloss., *Ranunculus auricomus* L., *Chrysosplenium alternifolium* L., *Myosotis sylvatica* Hoffm., *Galium odoratum* (L.) Scop., *Adoxa moschatellina* L., *Solidago virgaurea* L., *Carex rostrata* Stokes and *C. curta* Good, all recorded by D. J. Tennant from How Stean Gorge, Stean Moor and Acorus Scar, Stean Beck, Nidderdale (64).
- 44/12 *Epilobium parviflorum* Schreb. (63) Sun Wood, Shelf nr. Halifax; D. Grant & T. Schofield.

NORTH RIDING: (C. M. Rob)

The outstanding discovery of the year was made by Mrs. Holloway, *Epipactis leptochila*, growing in two places on the banks of the river Swale near Richmond. The plant was noticed in 1965, and last July Dr. Young visited the two localities and confirmed the record. The plant grows in fairly deep shade on ground which is submerged when the river is in spate, a common occurrence in winter and as happened also on more than one occasion during the past summer. The localities are about one and a half miles apart, but are in different 10 km. squares. This species is generally southern in distribution with the exception of a doubtful record for V.C. 66, and up to the recent discovery has not been recorded north of Gloucestershire and Shropshire.

Mrs. Holloway also found *Sparganium minimum* near Brignal while prospecting for the Y.N.U. excursion.

Mr. Medd has recorded a number of species from the York district including *Aphanes microcarpa* which was also noted in V.C. 65 at the Y.N.U. meeting. The distribution of the two species in the county has not so far been worked out.

Mr. Simpson has done some good work in the Pickering district and confirms the persistence of *Carex pauciflora* in its old station near the source of the Derwent below Lilla Cross. *Paris quadrifolia* he records from seven new sites, *Convallaria* from two, and a most interesting list of additions to the 10 km. squares made Mr. Simpson's contribution a valuable addition to this year's report.

Gentiana pneumonanthe flowered late both at Stape and Strensall. At the latter place a few plants of *Drosera intermedia* were noted very near the Flaxton road in a popular picnic area which is being badly trampled by visitors. Several interesting plants were seen growing near the river Tees at Startforth opposite Barnard Castle. This river, like the Swale is given to sudden and violent flooding and some of the more shallow rooting species may not be able to survive for long. *Catabrosa aquatica* appeared to have been washed away soon after it was noted in mid-August. Both *Galium boreale* and *Plantago maritima* have been recorded from the Tees banks almost down to Croft near Darlington, occurring as wash-downs in the area subject to flooding.

- Juniperus communis* L. (62) Flainsey Rigg, near Dalby, 44/88; G. Simpson.
Trollius europaeus L. (62) Low Muffles, Wrelton, 44/79; G.S.
Helleborus viridis L. (65) Patrick Brompton, 44/29; Mrs. J. Holloway.
Ranunculus arvensis L. (62) Low Dalby, 44/88; G.S.
Ranunculus hederaceus L. (62) Lounsedale in Cleveland, 45/50; Y.N.U. meeting, Gt. Ayton.
Ranunculus trichophyllus Chaix (65) Woodale, Coverdale, 44/07; C.M.R.
Hornungia petraea (L.) Reichb. (65) Rocks near road on moor above Hardraw, Wensleydale, 34/89; W. A. Sledge. Confirmation of pre-1930 Atlas record.
Sagina ciliata Fr. (62) Sandhutton, York, 44/65; T. F. Medd.
Spergularia rubra (L.) J. & C. Presl (62) Middleton Moor, 44/79; G.S.
Aphanes microcarpa (Boiss. & Reut.) Rothm. (62) Buttercrambe Moor Wood; T.F.M. (65) Barningham; Y.N.U. meeting.
Saxifraga hirculus L. (65) Great Shunner Fell, 34/89; D. A. Ratcliffe. *Nat.* 136, 1967.
Drosera intermedia Hayne (62) Still at Strensall, 44/66; C.M.R.
Peplis portula L. (62) Field near railway, Pilmoor; C.M.R.
Epilobium adenocaulon Hausskn. (62) Sutton under Whitestonecliffe, 44/48; T.F.M. Catton, 44/37; C.M.R.
Myrrhis odorata (L.) Scop. (62) Crambeck, 44/76; T.F.M. Confirms pre-1930 record in Atlas.
Peucedanum ostruthium (L.) Koch (65) Lonton in Teesdale, 35/92; C.M.R.
Rumex longifolius DC. (65) Caldwell, 45/11; C.M.R.
Myosotis brevifolia C. E. Salmon (65) Baldersdale, 35/81; C.M.R.
Euphrasia borealis Wettst. (65) River bank, Startforth, 45/01; J.H. & C.M.R.
Mentha gentilis L. (65) River bank, Startforth, 45/01; J.H. & C.M.R.
Mentha piperita L. (65) Startforth, 45/01; J.H. & C.M.R.
Stachys × *ambigua* Sm. (62) Pilmoor; C.M.R.
Plantago maritima L. (65) Startforth, 45/01; J.H. & C.M.R.
**Epipactis leptochila* (Godfery) Godfery (65) Near river Swale, Easby, 44/19 and Richmond, 45/10; J.H.
Platanthera chlorantha (Custer) Reichb. (62) Red House Wood, Broxa, 44/99; G.S. (65) Woodale, Coverdale, 44/07; C.M.R.
Sparganium minimum Wallr. (65) near Brignall, 45/01; J.H.
Scirpus sylvaticus L. (65) Startforth, 45/01; J.H. & C.M.R.
Eleocharis multicaulis (Sm.) Sm. (62) Blea Hill Beck, 45/80, and upper Derwent, 44/89; G.S.
Schoenus nigricans L. (62) Stockland Beck, 44/99; G.S.
Calamagrostis epigejos (L.) Roth (65) Camphill Wood, Kirklington, 44/38; Lady Ropner comm. C.M.R.

ALIENS AND CASUALS: (Mrs. F. Houseman)

More records of established alien plants have been sent in this year. Wool aliens are scarce now due chiefly to new regulations regarding tipping of wool waste. It is clear that *Epilobium nerterioides* and *Veronica filiformis* are increasing rapidly as more records are received each year.

The following have kindly sent records:— G. Beaumont, F. E. Branson, Mrs. Burdon, E. Chicken, Miss E. Crackles, Mrs. J. E. Duncan, C. Hartley, I. C. Lawrence, Miss H. Lefevre, T. F. Medd, F. Murgatroyd, J. Oxtoby, Miss C. M. Rob, Lady Ropner, G. A. Shaw, R. E. B. Taylor, E. Thompson, Miss D. Walker.

- Mahonia aquifolium* (Pursh) Nutt. (62) East Ayton; T.F.M.
Rapistrum perenne (L.) All. (62) Railway bank, Warrenby; J.C.L.
Geranium macrorrhizum L. (64) Yorks. side of R. Hodder; F.H.
Acer platanoides L. (64) Healaugh; T.F.M.
Trigonella polycerata L. and *T. caerulea* (L.) Ser. (det. J.E.L.) (63) Mirfield; R.E.B.T.
Medicago sativa L. and *M. arabica* (L.) Huds. (61) Germany Lane, Fulford, York.
Melilotus indica (L.) All. (63) Mirfield; R.E.B.T.
Coronilla varia L. (61) Driffild; Miss Taylor and Mr. Rushton.
Galega officinalis L. (61) In quantity, roadside, Ferriby; E.Ch.
Vicia vestita Boiss. (64) Baildon; F.B.
V. narbonensis L. (det. J.E.L.) (63) Mirfield; R.E.B.T.
Rubus spectabilis Pursh (61) Risby; E.C.
Prunus cerasifera Ehrh. (62) Hedge, East Ayton; T.F.M.

- Tolmiea menziesii* (Pursh) Torr. & Gray (61) Rampart, Bilton Beck, Harrogate; F.E.B. and G.A.S.
- Saxifraga hirsuta* L. (63) Crownest wood, Hebden Bridge; F.M.
- Epilobium nerterioides* Cunn. (64) Acorus scar, Stean Beck; D. J. Tennant. Cautley Spout; F.H. (65) Colsterdale; Y.N.U. Bryol. meeting.
- Polygonum cuspidatum* Sieb. & Zucc. (62) Langton on Swale; C.M.R. Near Hardraw, Wensleydale; C.M.R.
- P. equisetiforme* Sibth. & Sm. (det. J.E.L.) (64) Baildon; F.H.
- Castanea sativa* Miller (62) Roadside, Sand Hutton, York; T.F.M.
- Calystegia pulchra* Brummitt (64) Collingham; F.H.
- Datura stramonium* L. (65) Scruton; C.M.R.
- Hyoscyamus niger* L. (63) Mirfield; R.E.B.T.
- Verbascum virgatum* Stokes (63) Mirfield; R.E.B.T.
- V. nigrum* L. (61) Lowthorpe; E.Ch. (65) Jervaulx Abbey; J.H.
- Cymbalaria pallida* (Ten.) Wettet. (64) Pateley Bridge; C.M.R.
- Veronica filiformis* Sm. (61) Sunk Island; Mrs. Thistleton per E.C. Lawnweed, Hull and Hornsea; E.C. (64) Meadow near Horton-in-Ribblesdale; Y.N.U. Excn. Harrogate Stray, Harlow Hill area and Ripley Park; D.W. Near Litton; J.E.D. (65) Grassfield, east end of Leyburn Shawl; C.M.R. and D.W.
- Campanula persicifolia* L. (64) Wood near Mickley; C.M.R.
- Physocarpus opulifolius* Max. (65) Barningham; Y.N.U. Excn.
- Cephalaria elata* Hornem. (65) Roadside near Baldersby; C.M.R.
- Galinsoga ciliata* (Raf.) Blake (63) Chickenly nr. Mirfield; C.H. (65) Garden weed, Camphill, Kirklington; Lady Ropner.
- G. parviflora* Cav. (61) Riccall; Miss Taylor and Mr. Rushton (64) Garden weed, York; T.F.M.
- Senecio squalidus* L. (64) Knaresborough; J.O. Crossgates station nr. Leeds and about loco. sheds Leeman Road, York; G.A.S.
- Onopordum acanthium* L. (61) Sands Wood near Wintringham; E.Ch.
- Centaurea diluta* Ait. (62) Topcliffe; C.M.R.
- C. cyanus* L. (64) Several plants in a meadow at Dacre Banks, Nidderdale; J. Grace per E.T.
- Helianthus rigidus* (Cass.) Desf. (64) Beanlands Island, Ilkley; J.E.D.
- Cicerbita macrophylla* (Willd.) Wallr. (62) Lastingham; C.M.R. (64) Yorks. side of Hodder, Dolford Bridge; F.M.
- Lilium martagon* L. and *L. pyrenaicum* Gouan (65) Barningham; Y.N.U. Excn.
- Tulipa sylvestris* L. (61) South Cave; Mr. Cutts per E.C.
- Ornithogalum nutans* L. (65) Field near Hauxwell; Mrs. Burdon per C.M.R.
- Juncus tenuis* Willd. (63) Railway bank, Brighouse; Messrs. Grant & Schofield (64) Harrogate Road to Kex Beck; G.A.S.
- Scirpus nodosus* Rottb. (det. J.E.L.) (64) Baildon; F.H.
- Lolium temulentum* L., *Panicum miliaceum* L. and *Setaria italica* (L.) Beauv. (62) Topcliffe tip; C.M.R.
- Hordeum jubatum* L. (61) Germany Lane, Fulford, York; T.F.M. (62) Reseeded field, riverside, Clifton, York; T.F.M.
- Poa chaixii* Vill. (64) Askham Richard churchyard; C.M.R.

BRYOLOGY

This has been a very good bryophyte year and again many interesting records have been made and many new locations discovered for the commoner species. Two field meetings have been held. The visit to Birk Gill, Colsterdale, V.C. 65, has been reported fully in *The Naturalist*. The recent field meeting, 2nd to 9th September, held jointly with the B.B.S. at Northallerton with the object of recording bryophytes from little worked areas of V.C. 62 and confirming a number of old records, was most successful but is not reported here as much work still remains to be done on the material collected. It will be included in next year's report. Two of us also attended the Botanical Section's excursion to Richmond on 21st May, and this also proved a rich area for bryophytes — both *Isoetecium myurum* and *Anomodon viticulosus* were abundant. During the year twelve new V.C. records for mosses and four for hepatics have been made. The Bryological Section will in future visit each of the five Yorkshire Vice-Counties in turn.

HEPATICA (F. E. Branson): *A deletion*: On 24th September 1897, William Ingham of York, gathered a *Scapania* from Jackdaw Crag Quarry near Tadcaster, V.C. 64, which both he and Mr. MacVicar named a 'curious form of *Scapania aequiloba*'. Later they both thought it quite likely to be *Scapania calcicola*, new to Britain. Mr. Ingham sent a specimen to Dr. Arnell of Uppsala, Sweden, the author of an article on the species, who confirmed this opinion, and there is an article in *The Naturalist* 1904, 11-12 by William Ingham entitled '*Scapania calcicola*: a new British Hepatic'. Mr. A. R. Perry of Oxford University has recently examined this packet from the Ingham Herbarium and replies:— 'it is unfortunately not *S. calcicola* as Arnell first thought, and I have identified it as *S. aequiloba*.' This record has now been deleted from the Y.N.U. Hepatic record book. The only known location for this plant in the British Isles is in V.C. 88 (mid-Perth).

The following list includes the more interesting records for the past year.

* denotes new vice-county records, † new county record.

- Anthoceros laevis* L. (64) Bramham Park, 25th Sept. 1967; G.A.S. Confirmation of 1951 record of L. I. Scott & H. Walsh.
- Preissia quadrata* (Scop.) Nees (64) Studley Park, 2nd July 1967; F.E.B.
- Ricciocarpus natans* (L.) Corda (63) Ponds at Thorne, 28th Sept. 1967; G.A.S. Confirmation of a record of Dr. J. M. Taylor made some twenty years ago. (*65) Pond near Fatten Hill Plantation, Ellerton Hill, 22nd March 1967; Miss D. R. Walker & Mrs. Haythornthwaite.
- Riccardia sinuata* (Dicks.) Trev. (64) Near S. Stainley, 23rd Oct. 1966; F.E.B.
- R. pinguis* (L.) Gray (61) Wharram quarry, Malton, 20th Nov. 1966; F.E.B. & M.D.
- (65) Birk Gill, Colsterdale, fine male plants and female plants, 15th April 1967; F.E.B.
- **Pellia neesiana* (Gottsche) Limpr. (65) Birk Gill, Colsterdale, 15th April 1967; F.E.B.
- Metzgeria furcata* (L.) Dum. (61) Cansdale, near Filey, 23rd Oct. 1966; M.D. (64) Jackdaw Crag quarry, Tadcaster, 22nd Jan. 1967; F.E.B.
- M. fruticulosa* (Dicks.) Evans. (65) Barningham Park Wood, July 1967; M.D.
- M. pubescens* (Schrank) Raddi (65) Downholme, Richmond, 21st May 1967; F.E.B. & M.D.
- Blasia pusilla* L. (64) Bramham Park, 25th Sept. 1967; G.A.S. Confirmation of record made by L. I. Scott in Oct. 1929. (65) Birk Gill, Colsterdale, 15th April 1967; G.A.S. & F.E.B.
- Trichocolea tomentella* (Ehrh.) Dum. (65) Birk Gill, Colsterdale, 15/4/67; F.E.B.
- Calypogeia trichomanis* (L.) Corda emend. Buch (64) Scotton Banks Knaresborough, 5th February 1967; F.E.B. (*65) Cleve Beck near bridge from Brough to Middleton-in-Teesdale, 9th July 1967; M. Gow.
- Leiocolea badensis* (Gottsche) Jörg. (64) Jackdaw Crag quarry, Tadcaster, 22nd Jan. 1967; F.E.B.
- Solenostoma sphaerocarpum* (Hook.) Steph. (65) Birk Gill, Colsterdale, 15th April 1967; F.E.B.
- Plectocolea obovata* (Nees) Mitt. (65) Birk Gill, Colsterdale, 15th April 1967; F.E.B.
- Chiloscyphus pallescens* (Ehrh.) Dum. (65) Birk Gill, Colsterdale, 15/4/67; F.E.B.
- †*Cephaloziella stellulifera* (Spruce) Schiffn. (64) Riffa Wood, Pool-in-Wharfedale, 7th Feb. 1967; M.D.
- Nowellia curvifolia* (Dicks.) Mitt. (64) Ling Gill, Ribbleshead, 29th May 1967; M. Gow. (65) Birk Gill, Colsterdale, 15th April 1967; M.D.
- Scapania umbrosa* (Schrad.) Dum. (65) Brignall Banks, 8th July 1967; M.D.
- Porella cordaeana* (Hub.) Evans (64) Between Birkham Wood and Low Bridge, Knaresborough, 9/10/66; Scotton Banks, Knaresborough, 14/5/67; F.E.B.
- Lejeunea cavifolia* (Ehrh.) Lindb. (64) Ling Gill, Ribbleshead, June 1967; F.E.B.
- Cololejeunea calcarea* (Lib.) Schiffn. (64) Ling Gill, Ribbleshead, 29/5/67; M. Gow.
- Frullania tamarisci* (L.) Dum. (65) Brignall Banks, 8th July 1967; M.D.
- F. dilatata* (L.) Dum. (61) Primrose Valley, Filey, 24th Oct. 1966; M.D. (65) Brignall Banks, 8th July 1967; F.E.B.
- Nomenclature follows the *Census Catalogue of British Hepatics*, J. A. Paton, 1965.
- MUSCI: (M. Dalby):
- **Fissidens minutulus* var *tenuifolius* (Boul.) Norkett. (64) Jackdaw Crag, Jan. 1967; F.E.B. & M.D. Bilton Banks, Mar. 1967; F.E.B. & G.A.S.
- Seligeria acutifolia* var *longiseta* Lindb. (64) Hartlington Gill, Oct. 1966; G.A.S.
- S. paucifolia* (Dicks.) Carruth. (61) Huggate chalk quarry, Aug. 1967; J.R.

- S. calcarea* (Hedw.) B., S. & G. (61) Huggate chalk quarry, Aug. 1967; J.R.
 **Blindia acuta* var *arenacea* Mol. (65) Birk Gill, Colsterdale, Apr. 1967; F.E.B.
Dicranella subulata (Hedw.) Schimp. (65) Birk Gill, Colsterdale, Apr. 1967; G.A.S.
Dicranum strictum Schleich ex Schwaegr. (64) Middleton Woods, Ilkley, Jan. 1967;
 M.D. Bilton Banks, Mar. 1967; G.A.S. Eavestone Lake, May 1967; M.D.
 **Campylopus introflexus* (Hedw.) Brid. (65) Scuddale spoil heap, Aug. 1967; B.O'S.
Aloina brevirostris (Hook. & Grev.) Kindb. (64) Burton Leonard, Nov. 1966; F.E.B.
A. rigida (Hedw.) Limpr. (64) Burton Leonard, Nov. 1966; F.E.B.
Pottia davalliana (Sm.) C. Jens. (61) Wharram quarry, Nov. 1966; F.E.B. & M.D.
Gymnostomum calcareum Nees & Hornsch. (64) Near South Stainley, Oct. 1966;
 G.A.S. & F.E.B. Ling Gill, Ribbleshead, June 1967; M.G. excn. Y.N.U. Loup
 Scar, Burnsall, June 1967; M.D. *(65) Downholme, Richmond, May 1967;
 F.E.B. & M.D.
Gyroweissia tenuis (Hedw.) Schimp. (64) Scotton Banks, Feb. 1967; F.E.B.
Splachnum ampullaceum Hedw. (64) Denton Moor, Ilkley, Jan. 1967; M.D.
 **Pholia rothii* (Correns) Broth. (64) Lindley Reservoir wood, Dec. 1966; M.D.
 **Bryum rubens* Mitt. (62) Catton, Jan. 1951; J. Appleyard.
Philonotis fontana var *adpressa* (Ferg.) Limpr. (65) Birk Gill, Colsterdale, Apr. 1967;
 F.E.B. excn. Y.N.U.
Orthotrichum cupulatum var *nudum* (Dicks.) Braithw. (65) Downholme, Richmond,
 May 1967; F.E.B. & M.D.
O. affine Brid. (64) Scotton Banks, May 1967; F.E.B.
O. rivulare Turn. (65) Brignall Banks, R. Greta, July 1967; M.G. excn. Y.N.U.
 **Fontinalis squamosa* Hedw. (62) Eskdale, near Castleton, Aug. 1967; B.O'S.
 **Thuidium philibertii* Limpr. (61) Huggate chalk quarry, June 1967; J.R. excn. Y.N.U.
Hygroamblystegium tenax (Hedw.) Jenn. (64) Winksley, July 1967; F.E.B.
H. fluviatile (Hedw.) Loeske (64) Scotton Banks, May 1967; F.E.B.
Amblystegium kochii B., S. & G. (64) Copgrove, May 1965; G.A.S. & F.E.B.
Brachythecium salebrosus (Web. & Mohr.) B., S. & G. *(61) Huggate, June 1967;
 F.E.B. excn. Y.N.U. (64) Studley Park, July 1967; F.E.B.
Orthothecium intricatum (Hartm.) B., S. & G. (64) Hartlington Gill, Oct. 1966; G.A.S.
 **Plagiothecium latebricola* B., S. & G. (65) Brignall Banks, R. Greta, July 1967; M.D.
 excn. Y.N.U.
 **P. denticulatum* var *obtusifolium* (Turn.) Paris (65) Millbeck Wood, Teesdale, Aug.
 1964; G.G.
 **P. curvifolium* Schlieph ex Limpr. (65) High Force, Teesdale, Aug. 1964; G.G.
 †*P. laetum* B., S. & G. (65) Brignall Banks, R. Greta, July 1967; M.D. excn. Y.N.U.
Hylacomium brevirostre (Brid.) B., S. & G. (65) Birk Gill, Colsterdale, Apr. 1967;
 F.E.B. excn. Y.N.U.
- Nomenclature follows E. F. Warburg, *Census Catalogue of British Mosses* 3rd edition, 1963. My thanks are due to Messrs. F. E. Branson, G. A. Shaw, B. O'Shea, Rev. G. G. Graham, Dr. M. Gow and Miss J. Robertson for the above records.

Key to the Families of Flowering Plants of the World by J. Hutchinson.
 Pp. 117 with 6 figures. Clarendon Press: Oxford University Press. 1967. Paperback
 18/-, Hardback 30/-.

Dr. Hutchinson's two volume work on the *Families of Flowering Plants* included an artificial key to the families. Practical use over many years inevitably reveals snags and unworkable — or at least unsatisfactory — parts in such a compilation and the present work represents a revised and rearranged key by which it is now 'Confidently expected that the family of a very large percentage of flowering plants, wild or cultivated in any part of the world, may be ascertained'. Four hundred families are included and whilst the arrangement is substantially similar to that of the earlier key it may be assumed that both the improvements incorporated in the contrasting clauses of the key and the increase in the number of families through subdivision, which makes for more accurate delimitation of groups, will both facilitate identifications. The problem of the 'untypical' genus is covered as far as possible by many families receiving several entries in the key. A short glossary and a few diagrammatic illustrations have been added.

This is a book which not only University libraries and institutions which have any concern for taxonomic botany should possess, but one which will be of interest and use to all systematic botanists whose horizons are not narrowly limited. W.A.S.

THE NATIONAL BADGER SURVEY

Many readers will probably already be familiar with the British Mammal Society's National Badger survey, which is being conducted county by county throughout the country. My predecessor Mr. G. Teasdill, was county recorder for the whole of Yorkshire, but since I became recorder in June, 1967 I have limited myself to the West Riding only, and have persuaded a friend, Mr. Adrian Middleton of Lund, Driffield, to record in the East Riding. As yet there is no recorder for the North Riding.

The aim of the survey is to record details such as site and size of sett, soil, vegetation, etc., with accurate grid reference, with a view to scientific analysis in the hope of further understanding the badger and its distribution. Some counties are well under way; in Somerset for example over 1,200 setts are recorded. Before taking on the West Riding I had the pleasure of helping with Nottinghamshire and we have 56 setts recorded in the county; the number so far recorded in the West Riding is 76 and this is climbing slowly every week. Most of the setts recorded are in one of three groups, which reflect the activity of local recorders rather than the true distribution of the badger. The biggest number of setts recorded is in the southern parishes of the county in the sector bounded by Sheffield, Rotherham and Doncaster and Mr. Reg Bramhill of Rotherham Naturalists has been most helpful here; another nucleus is around the parishes south of Huddersfield and Mirfield (thanks to Norman Handley) and west of Barnsley. I have, as yet, no records of setts further north than Huddersfield.

The setts are very varied in type and we have records from clay, sand, limestone, millstone grit and shale; in deciduous woods, conifer plantations, hedgerows, open fields, river banks, quarries and old mine workings. Most are smaller than the ones known to me in the Cotswolds. The proximity to human life is surprisingly close at some setts on the edges of our large towns and I had the pleasure of watching one in Sheffield in the summer when badgers emerged whilst nearby gardeners tended their bonfires! One of the lowest lying setts in the country only ten feet above sea level, is on Hatfield Moors and this is in peaty soil.

There must be many setts known to individual naturalists in the county not officially recorded and I would be pleased to hear from people; also I would be pleased to hear from anyone willing to act as a local recorder in the north of the county.

May I express my thanks to other helpers not previously mentioned, Bill Stoney, David Holmes, Charles Waite; to land owners, farmers and keepers who have given help by allowing access to the setts on their land.

RICHARD J. PAGET, 13 *The Baulk, Worksop, Notts.*

CANADA GEESE BREEDING AT FAIRBURN INGS NATURE RESERVE

In July, 1966, three wing-clipped juvenile Canada Geese from the Swinton Park stock were released at Fairburn Ings Nature Reserve. At about the same time a bird with an injured (probably broken) wing arrived at the western (Ledston) end of the reserve, and finally made its way to, and settled at Newton where it soon attracted a second bird which stayed with it.

During the spring of 1967, Canada Geese occurred on the reserve more regularly and in larger numbers than usual, mainly at Newton, a dozen or more frequently feeding in the fields by Newton Abbey during April. We believe that they were attracted by the wing-clipped introduced birds and the one with a broken(?) wing. Although there was less evidence of adult free-flying birds during May, on 1st June, 1967 we saw a pair of Canada Geese with five recently hatched goslings. This was the first instance of breeding which either of us had known in over fifteen years' knowledge of the area, during which, (apart from 38 on 28th Sept., 1958) we have classified the species as an 'irregular visitor in small numbers'; hence it seemed worthwhile looking at past records.

In the twenties and thirties, when mining subsidence was beginning to induce the present permanent marshland, flocks of 150 were not infrequently seen (*The Naturalist* 225, 1938), but W. G. Bramley who lived at Fairburn from 1919 to 1928 had no record of Canada Geese breeding there during that period nor up to 1938. He had recorded them during the breeding season only in 1921 when 2 birds were present in May. In 1938, however, R. Chislett reported a pair with five young. This appears to be the only previous record of Canada Geese breeding at Fairburn.

C. WINN AND R. F. DICKENS

THE YORKSHIRE PROFIT AND LOSS ACCOUNT

EXPENDITURE

GENERAL PRINTING:

1966	£	s.	d.						£	s.	d.	£	s.	d.
32	4	0		Members' Cards	...	...	...	...	32	10	0			
74	19	1		Circulars	...	...	...	...	84	15	3			
-	-	-		List of Members	...	...	...	...	72	15	0			
107	3	1												
				<i>The Naturalist:</i>										
				Cash Paid	...	...	...	...	753	6	6			
				Editor's Expenses	...	...	...	...	4	0	0			
582	5	6		Less Sales to non-members	...	...	...	...	757	6	6			
									149	10	0			
				Extra Pages and Illustrations	...	...	...	...	67	5	0			
26	15	0		Less Received from Y.N.Trust	...	...	...	...	16	0	0			
				SUNDRY EXPENSES:										
32	9	3		Officers' Expenses	...	...	...	...	41	12	2			
15	6	6		Duplicating and Stationery	...	...	...	...	19	18	1			
15	13	6		Bank Charges	...	...	...	...	8	14	9			
12	10	0		Subs. and Donations paid	...	...	...	...	3	2	0			
19	4	9		Cost of News Letters	...	...	...	...	35	10	9			
10	0	0		Spraying Symposium	...	...	...	...	-	-	-			
59	9	7		Profit	...	...	...	...						
£880	17	2										£987	6	1

BALANCE SHEET as

£	s.	d.						£	s.	d.	£	s.	d.
			ACCUMULATED FUNDS — GENERAL										
			Booth Fund	...	...	...	...	100	0	0			
			Cheesman Fund	...	...	...	...	100	0	0			
			R. C. Fowler Jones Legacy	...	...	...	...	250	0	0			
			E. G. Bayford Legacy	...	...	...	...	100	0	0			
			R. Chislett Legacy	...	...	...	...	500	0	0			
1050	0	0									1050	0	0
			MYCOLOGICAL FUND:										
			Balance brought forward	...	...	...	...	132	13	11			
			Cash received and in transit	...	...	...	...	15	1	10			
132	13	11									147	15	9
1147	6	0	ORNITHOLOGICAL FUND — Capital	...	...	...	...				1147	6	0
			Revenue:										
			Balance brought forward	...	...	...	...	54	4	0			
			Interest on Investments	...	...	...	...	66	0	0			
			Less Expended	...	...	...	...	120	4	0			
54	4	0						9	1	11			
			LIFE MEMBERS' ACCOUNT:										
			Balance brought forward	...	...	...	...	117	15	0			
			Cash received	...	...	...	...	20	0	0			
			Less Transfer subscriptions	...	...	...	...	137	15	0			
117	15	0						15	0	0			
			SUNDRY CREDITORS:										
			Subscriptions paid in advance	...	...	...	...						
76	9	0									24	15	0
			PROFIT AND LOSS ACCOUNT:										
			Balance brought forward	...	...	...	...	719	9	7			
			Add Profit	...	...	...	...	29	6	7			
719	9	7									748	16	2

AUDITORS' REPORT

We have audited the foregoing Income and Expenditure Account and Balance Sheet of the Yorkshire Naturalists' Union with the books, records and vouchers produced to us and certify the same to be in accordance therewith and with the information and explanations we have received.

WHITHAM, SMITH, MITCHELL & CO.,
Chartered Accountants,
4-6 Harrison Road,
Halifax.

31st December, 1967.

£3297 17 6

£3352 10 0

NATURALISTS' UNION

Year to 30th September, 1967

1966	INCOME						£	s.	d.
£ s. d.									
708 14 9	Subscriptions and Donations	...	...	...	...	...	734	13	1
21 4 4	Interest on Dividends	...	...	...	...	...	84	4	9
20 7 1	Bank Interest	...	...	...	...	...	19	4	9
109 3 10	Income Tax on Covenants	...	...	...	...	...	141	5	5
21 7 2	Sale of Publications	...	...	...	...	...	7	18	1

CHISLETT MEMORIAL FUND:

Balance brought forward	...	...	279	18	5
Interest received	...	...	12	4	8

			292	3	1
Less Cost of Second Lecture	...		20	5	6

Balance in Westminster Bank	...		271	17	7
-----------------------------	-----	--	-----	----	---

£880 17 2

£987 6 1

at 30th September, 1967

£	s.	d.		£	s.	d.	£	s.	d.	£	s.	d.
			INVESTMENTS (at cost):									
			ORNITHOLOGICAL ACCOUNT:									
			Nicholas Fund: 3% Brit. Transport	...	100	0	0					
			Chislett Legacy:									
			£600 5½% Treas. Stk.	...	545	9	0					
1147	6	0	£600 5% Treas. Stk.	...	541	17	0	1147	6	0		
			GENERAL ACCOUNT:									
			Booth Fund 3½% Conversion Stock	...	100	0	0					
			Cheesman 3½% War Stock	...	100	0	0					
			4% Consols (Bank of England)	...	200	0	0					
			4% Consols (Post Office)	...	159	10	11					
			300 Unilever Ordinary Shares	...	522	1	6					
1592	19	5	250 Shell Trans. Ord. Shares	...	511	7	0	1592	19	5		
2740	5	5						2740	5	5		
235	0	0	Less Reserve for Depreciation	...	...	...	...	235	0	0		
2505	5	5									2505	5 5
			BANK ACCOUNTS:									
403	16	3	York County Savings Bank	...	...	...	422	13	0			
16	2	0	Add Interest accrued	...	...	...	16	10	0			
419	18	2					439	3	0			
192	19	6	Westminster Bank Current A/c.	...	...	...	168	19	6			
612	17	9								608	2	6
			SUNDRY DEBTORS:									
			Subscriptions unpaid	...	...	8	0	0				
			Less Reserve Bad Debts	...	...	5	0	0				
									3	0	0	
			Income Tax Repayable:									
			Dividends	...	...	...	24	0	3			
179	14	4	Cash in transit	...	...	...	212	1	10	239	2	1

£3297 17 6

£3352 10 0

THE YORKSHIRE PROFIT AND LOSS ACCOUNT

		EXPENDITURE			
GENERAL PRINTING:					
1966	£ s. d.		£ s. d.	£ s. d.	
32	4	0			
74	19	1			
107	3	1			
		Members' Cards		32	10
		Circulars		84	15
		List of Members		72	15
				190	0
		<i>The Naturalist:</i>			
		Cash Paid		753	6
		Editor's Expenses		4	0
				757	6
582	5	6		607	16
		<i>Less</i> Sales to non-members		149	10
		Extra Pages and Illustrations		67	5
		<i>Less</i> Received from Y.N.Trust		16	0
				51	5
		SUNDRY EXPENSES:			
		Officers' Expenses		41	12
		Duplicating and Stationery		19	18
		Bank Charges		8	14
		Subs. and Donations paid		3	2
		Cost of News Letters		35	10
		Spraying Symposium		—	—
				108	17
		Profit		29	6
£880	17	2		£987	6

BALANCE SHEET as

£	s.	d.	ACCUMULATED FUNDS — GENERAL	£	s.	d.	£	s.	d.
			Booth Fund				100	0	0
			Cheesman Fund				100	0	0
			R. C. Fowler Jones Legacy				250	0	0
			E. G. Bayford Legacy				100	0	0
			R. Chislett Legacy				500	0	0
1050	0	0							1050 0 0
			MYCOLOGICAL FUND:						
			Balance brought forward				132	13	11
			Cash received and in transit				15	1	10
132	13	11							
1147	6	0	ORNITHOLOGICAL FUND — Capital						1147 6 0
			Revenue:						
			Balance brought forward				54	4	0
			Interest on Investments				66	0	0
							120	4	0
54	4	0	Less Expended				9	1	11
									111 2 11
			LIFE MEMBERS' ACCOUNT:						
			Balance brought forward				117	15	0
			Cash received				20	0	0
							137	15	0
117	15	0	Less Transfer subscriptions				15	0	0
									122 15 0
			SUNDRY CREDITORS:						
			Subscriptions paid in advance						24 15 0
76	9	0	PROFIT AND LOSS ACCOUNT:						
			Balance brought forward				719	9	7
			Add Profit				29	6	7
719	9	7							748 16 7

AUDITORS' REPORT

We have audited the foregoing Income and Expenditure Account and Balance Sheet of the Yorkshire Naturalists' Union with the books, records and vouchers produced to us and certify the same to be in accordance therewith and with the information and explanations we have received.

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£3297 10 6

£3352 10 0

NATURALISTS' UNION

Year to 30th September, 1967

		INCOME			
1966	£ s. d.		£ s. d.	£ s. d.	
708	14	9			
21	4	4			
20	7	1			
109	3	10			
21	7	2			
		Subscriptions and Donations		734	13
		Interest on Dividends		84	4
		Bank Interest		19	4
		Income Tax on Covenants		141	5
		Sale of Publications		7	18
				279	18
		CHISLETT MEMORIAL FUND:		12	4
		Balance brought forward		292	3
		Interest received		20	5
		<i>Less</i> Cost of Second Lecture		271	17
		Balance in Westminster Bank			
£880	17	2		£987	6

at 30th September, 1967

£	s.	d.		£	s.	d.	£	s.	d.	£	s.	d.
			INVESTMENTS (at cost):									
			ORNITHOLOGICAL ACCOUNT:									
			Nicholas Fund: 3% Brit. Transport	...	100	0	0					
			Chislett Legacy:									
			£600 5½% Treas. Stk.	...	545	9	0					
			£600 5% Treas. Stk.	...	541	17	0					
1147	6	0						1147	6	0		
			GENERAL ACCOUNT:									
			Booth Fund 3½% Conversion Stock	...	100	0	0					
			Cheesman 3½% War Stock	...	100	0	0					
			4% Consols (Bank of England)	...	200	0	0					
			4% Consols (Post Office)	...	159	10	11					
			300 Unilever Ordinary Shares	...	522	1	0					
			250 Shell Trans. Ord. Shares	...	511	7	0					
1092	19	5						1592	19	5		
740	5	5						2740	5	5		
35	0	0						235	0	0		
105	5	5										
109	16	3										
16	2	0						422	13	0		
119	18	2						16	10	0		
192	19	6						439	3	0		
612	17	9						168	19	6		

£3352 10 0

CORRESPONDENCE

Dear Sir,

Races and plumages of Guillemots

In reply to Dr. Bourne's letter on my short paper on 'Northern Guillemots in Yorkshire Waters', I would make it quite clear that I was fully aware of the existence of the races *hyperborea* and *spiloptera*, but where does that get us?

I aimed my comments at the ordinary field worker, not the dedicated taxonomist. If people were to do more than put a desultory boot under a corpse and simply pronounce it 'dead', then the requested task had to be a simple one. As most of the corpses are either oiled or rotting or both, the most one could expect was the broad division of 'grey backed' Southern and 'black-backed' Northern. To have complicated the matter with other obscure races would have been ridiculous. Let us learn to walk before we attempt to run!

Those specimens which are sent to me for preservation are of course examined in order to determine their race more exactly. This of course can only be done in the laboratory with others for comparison and the man on the beach has no part to play in this, beyond sending the specimens in.

I must draw attention to an error in Dr. Bourne's second paragraph, line two. For 'later' read 'earlier'. Despite the remarks on moult in this same paragraph, the ones with delayed moult which I illustrated were 'black-backed' and therefore Northerns, and in any case there is no argument on this point, as his remarks confirm mine if one reads carefully.

The remarks about flank markings in paragraph three are also without foundation. It is a plain fact that Northerns have their flanks streaked blackish in varying degrees according to age and that Southerns have theirs streaked greyish to a lesser degree, especially in first year examples, when it is almost negligible. To suggest that the bird illustrated in my paper is an 'individual variation' is not valid. This example is not an exception; it is typical of many I have inspected. The remarks in paragraph four are mainly taxonomic and therefore not relevant to my paper. The discerning reader will learn to apply my criteria most effectively with a little practise and be able to separate *U. a. aalge* from *albionis* under field conditions.

It is perhaps a pity that Dr. Bourne added his last, strange paragraph. I would like to take this opportunity of thanking all those who have sent specimens for preservation, and those who have taken details of birds found and reported them.

JOHN R. MATHER

Dear Sir,

Empty bottles and small mammals

I was pleased to read Mr. C. G. Booth's timely note (*The Naturalist*, 1967: 80) about the danger caused to birds by discarded lengths of nylon fishing line.

Perhaps I might draw attention to another countryside hazard — the empty bottle thrown down at the wayside. If it lodges with even the slightest tilt towards the bottom end, it forms a death-trap to all manner of small creatures that enter but cannot climb out again up the slippery sides. An acquaintance has found the remains of twenty-eight small mammals in one such death-trap, and I have myself found old bottles half filled with bones and fur.

I suggest that we, as countrygoers, should 'immobilise' such dangerously-placed bottles when we come across them, and also should publicise our concern at the suffering they cause. Such action might even perhaps hasten the eventual discontinuance of glass — always a dangerous substance — in bottle manufacture.

K. G. SPENCER

Late Egg of House Sparrow

On Thursday, 26th October, a newly laid egg of House Sparrow was found on a trough of plants in my garden at Bradshaw near Bolton, Lancs. Pigmentation was virtually nil. Weather was exceptionally mild, bright and sunny.

ELLEN HAZELWOOD

BOOK REVIEWS

Pesticides and Pollution by Kenneth Mellanby. Pp. 221 with 14 plates, 2 in colour, and 8 text figures, *New Naturalist* series, Vol. 50. Collins. 30/-.

This book is essentially an account of the way in which man is unintentionally contaminating his environment. Pollution, including radiation, has developed as a side effect of the increase in human population and increased material productivity; while pest control has provided a different problem by reason of its unintended effects on other organisms.

Dr. Mellanby, Director of the Nature Conservancy's Monks Wood Experimental Station, writes as a dispassionate scientist in an attempt to assess the damage that has already been done, and the current threats to the natural heritage of man in this country. At the mention of the word 'pesticides' most naturalists recall the tremendous impact which Rachel Carson's book made on government departments and other policy-making groups; but Dr. Mellanby has deliberately avoided dealing with *Silent Spring* because he thinks 'the time has come to try to look at all sides of the problem'. A first reading of *Pesticides and Pollution* may give the impression that its author has been less helpful to the cause of the naturalist than one might hope, but second thoughts confirm the fact that he has treated his subject in a thoroughly scientific manner and has provided the naturalist with a reliable source of information.

Progress in the expanding economy of Britain is, however, not always regulated by calm, objective recommendations of scientists such as Dr. Mellanby, but by pressure groups often representing extreme opinions and not infrequently motivated by financial considerations. The naturalist, the politician and the industrialist can all be regarded as inflexible and uncompromising according to one's point of view. But all participants in any future controversy, whether it be another Teesdale or a new system of insecticides, will have Dr. Mellanby's cogent summary as a factual and unbiased guide.

The fact that *Pesticides and Pollution* is the 50th volume in the *New Naturalist* series calls for special mention. Over the last 25 years, Collins have provided the naturalist with books covering the whole spectrum of his interests, and there can have been few publishing ventures which have so successfully met the needs of a minority group. It is inevitable but regrettable that 15 years ago books in this series contained ten times as many colour plates, twice as many monochrome plates, a greater wealth of text figures and yet were only half the price. Nevertheless, the publishers are to be congratulated on a remarkably fine achievement, and deserve every success and encouragement in the production of the next fifty volumes. C.J.S.

Tracks by E. A. R. Ennion and N. Tinbergen. Pp. 63, with 122 photographs, drawings and combinations of both. Clarendon Press: Oxford University Press. 1967. 25/-.

The talents of two eminent naturalists have combined in this work to give us an original, imaginative, informative and often amusing slant on a well-used topic. Tracks can be fascinating or frustrating, depending on the degree of success which you have in contacting the animals which leave them. However, in this book the fine photographs by Professor Tinbergen, interpreted and embellished by Dr. Ennion's spirited drawings, capture the imagination and give greater meaning to the subject of tracks as indicators or reminders of the daily or nightly activities of animals — in this case ranging from insects to mammals. The pictures of Natterjack Toad and Adder tracks are truly remarkable. Feeding, fighting, playing, life and death, are all recorded or reconstructed here from traces in mud, sand and snow. This is a book well worth having or for giving as a present to any naturalist or country lover. T.M.C.

British Turtles by L. D. Brongersma. Pp. 23 with 19 text figures. Publication No. 659 of the British Museum (Natural History). Eyre and Spottiswoode. 1967. 2/6.

This is the authoritative guide to the five species of marine turtles which have occurred on the coasts of Britain. Dr. Brongersma, Director of the Leiden Museum, has in this publication brought up-to-date the earlier section of the 'Stranded Whales and Turtles Guide' and has added some extra material. As is usual with Natural History Museum publications this one is good value for money and should be in the hands of everybody who may, by chance, find themselves face to face with a stranded turtle, and with 61 records between 1950 and 1966, this could mean anybody. T.M.C.

A Field Guide to the Mammals of Great Britain and Europe by F. H. Van Den Brink. Pp. 221 with 20 coloured plates and 12 black and white plates. Collins, 1967. 30/-.

At last, after being available only in various European languages since 1955, an English edition of this work has appeared. All the 231 species which occur west of longitude 30° E. are described and illustrated. This book is the natural rucksack or pocket companion for the famous *Field Guide to European Birds* and is prepared along the same lines, using the Peterson system of field identification.

F. H. Van Den Brink has done a fine job in treating the mammals of Europe in field guide form even to the distribution maps. The latter, naturally, have a few gaps and omissions, but these are more of a spur to those who will plot changes in distribution in future editions than a detrimental feature; the impetus given to mammal study by a book of this type will see to that. As more and more British naturalists travel in Europe they will no doubt have cause to thank the author and the translators and editors, Hans Kruuk and H. N. Southern, for putting this book into their hands. No less will they thank Paul Barruel whose excellent paintings put life into illustrations which are so much more than mere pelage maps.

The book is as essential to the travelling naturalist as his passport and his Peterson! For the stay-at-home mammalogist it is a guide to British mammals as well as a book to browse in. T.M.C.

Mammals of Britain — Their Tracks, Trails and Signs by M. J. Lawrence and R. W. Brown. Pp. 223 with 32 coloured photographs and over 250 black and white photographs and line drawings. Blandford. 30/-.

The recent upsurge of mammal books is still new enough to be gratifying and this one will find a place on many bookshelves. It does not set out to teach one mammal identification from the whole animal, but contains a wealth of information on tracks, signs and remains which will prove very useful to many mammal students. Under the headings of occurrence, habits, habitats, tracks, trails, signs and dwelling place, with terms used for male, female and young if significant, each species is treated and there are keys and copious diagrams for the identification of remains from owl pellets. The authors claim that it is based almost entirely on their own fieldwork and this gives one confidence in it but, at the same time, a little more checking with literature would have helped, particularly with the distribution maps. The map for the mole gives areas of great abundance and those for which no information is available — the latter includes so much of Britain that the map is of very little value. Similarly, northern England appears to be devoid of Mink. However, it is a book which most of us will turn to from time to time when a footprint or a dropping gives us trouble and thus it can be recommended widely to both naturalists and people with general countryside interests.

The book is not dated, unfortunately, and in my copy a number of pages were not bound in. Apart from this the production is excellent. The colour photographs, by Geoffrey Kinns, are a pleasing gallery of mammal portraits. T.M.C.

Wild Life of the South Seas by F. A. Roedelberger and Vera I. Groschoff. (English version by Peter J. Whitehead). Pp. 216 with 250 photographs in colour and black and white by 60 photographers. Constable. 1967. 45/-.

This is the latest volume in a series which has looked at the wild life of large slices of the earth's surface and it is a superb pictorial review of the South Seas. The faunas of the Indo-Pacific, Indonesia, Australia, Oceania and the Galapagos Islands contain such a wealth of riches that starting on the task of discussing and illustrating them might be daunting. However, the authors and the photographers whose work is shown give a coverage which should suit everybody. The whole page colour photographs contain some classics and the black and whites often form series with enormous punch. The egg, nest and young series of the Crested Tree Swift, the set of Komodo Dragon pictures, the action shots of Koala Bear and indeed every picture in this work, whether taken in the museum or the wild — all are excellent. The list of photographers contains many names familiar to British readers, such as Des Bartlett, Jane Burton, Sven Gillsaeter, Heinz Siehlmann, John Warham, Cy La Tour, Loke Wan Tho, John Markham and a host of others. The text is clear and concise and makes a worthy complement to the pictures. A book which will be widely enjoyed. T.M.C.

The Birds of the Doncaster District by **R. J. Rhodes**. Pp. 101 with fold-in map. Published by the Doncaster and District Ornithological Society (1967) and obtainable from R. D. Mitchell, 125 Chequer Avenue, Belle Vue, Doncaster. 10/6 post free.

For the purposes of this book, the Doncaster district is not a geographically discrete one, but an arbitrary area enclosed by a circle of 10 miles radius from the centre of the borough, and including parts of Lincolnshire and Nottinghamshire. The main geological divisions within this circle and its wide variety of habitats are detailed. The comparatively recent changes in the latter, together with consequent effects on bird-life, are fully discussed. The fen, carr and marshland areas to the east are possibly the most interesting in that they show the greatest changes and have become regarded as the most typical of the Doncaster habitats. Clearly the writing of these sections has involved the author in a great depth of research — research which has not been confined solely to ornithological literature.

The main bulk of the book, 75 pages, is taken up by a classified list. The status of each species (based on occurrences this century) is given. In the subsequent information all traced records from the previous hundred year's literature are also included. Hence we learn, for instance, that Bittern, harriers, Black-tailed Godwit, Ruff, Crossbill, etc. formerly bred. Obviously the author will have had reservations about some of the old records of rarities (e.g. the undated Chough mentioned by Allis in 1844) and probably about some of those which he has included because they appeared in Y.N.U. Annual Ornithological Reports between eight and twenty-five years ago but which would have been unlikely to pass through the sieve of both the present Y.N.U. Records Committee and the B.B. Rarities Committee. There may be occasion, sometime, for a further reappraisal of some of these. This the author has already done for a 1958 Long-tailed Duck which still stands in the Y.N.U. Annual Ornithological Report for that year.

The well-documented records of the past two decades have been thoroughly sorted and are presented in a concisely written but easily readable form. (Insufficient precision in the writing of the comments on Wood Sandpiper is an exception.)

With typical modesty, Mr. Rhodes does not claim his own personal responsibility for quite a proportion of the observations. These will be recognised by those who have studied county reports over the past twenty years. There is no need for him to advance any claims as far as this present book is concerned. *The Birds of the Doncaster District* is an excellent volume on which his stamp is clearly marked. Of its kind it is an absolute model.

For its size the map has too much detail, and consequently suffers in clarity.
R.F.D.

Birds in Hull. A Hull Museum publication. Edited by **Patrick J. Boylan**. Pp. 16. Price 1/-. 1967.

A small booklet containing a systematic checklist of species of birds seen within the city boundary of Hull. The records are based mainly on a recent six year survey carried out by members of the vertebrate section of the Hull Scientific and Field Naturalists' Club.
M.D.

The Watcher at the Nest by **Margaret Morse Nice**. Pp. 159 with 19 illustrations by Roger Tory Peterson. Dover Publications, 1967; agents Constable and Co., 10-12 Orange Street, London W.C.2. 12/-.

This is a new edition of a book first published as long ago as 1939. Dr. Nice's name will always be associated with the Song Sparrow. Her monograph on the species was real pioneering in this type of intensive study. Approximately half the present volume deals with her seven years devoted to the study of this same species. It is charming and at times unashamedly anthropomorphic.

In the remaining half the nesting habits of Mourning Dove, Cowbird and Yellow-crowned Night Heron, among others, are described. There is a strong plea for the setting aside of areas as reserves, to 'look at the humble beauty of waste places not with prejudice but enlightenment . . .'.
R.F.D.

A Wealth of Wildfowl by Jeffery Harrison. Pp. 176 with 24 black and white plates + 2 maps. Andre Deutsch. 30/-.

'This is a book about wildfowl; about ducks and geese. It is also a book about Man; about the impact of Man on those duck and geese'. Such is the declaration of intent of Dr. Jeffery Harrison which is achieved so well in this excellent book.

After a survey of the traditional migratory routes of wildfowl, the value of national and international wildfowl counts is assessed, as are the contrasting effects of man's role in the provision of refuges and his destructive tendencies by the drainage and pollution of wetlands. The section dealing with the creation and management of wetlands should be read by all conservationists, ornithologists, wildfowlers and farmers; and those concerned with reserves with a population of wildfowl should heed Dr. Harrison's 'tale of constant change from Wigeon to Woodpeckers' due to plant succession and changing water levels. The frankly told story of the early attempts to unite the efforts of conservationists to those of the wildfowler is told with humour and understanding, and the illustrations by Mrs. Pamela Harrison — another ornithologist in this remarkable family — admirably support the well-written text. This enjoyable book should be owned by all with any interest in wildfowl.

J.D.P.

Where to Watch Birds by John Gooders. Pp. 313 with 12 pages of photographs and numerous maps. Andre Deutsch. 30/-.

One of the best things about bird-watching is that it can be enjoyed anywhere. The Camargue, Spurn Head, Buckingham Palace or your own back garden all provide bird-watching in different forms. But we all know of areas which are especially good for birds, attracting them in quantity or quality or a mixture of both. This new book by John Gooders gives explicit directions for reaching more than five hundred such areas in England, Wales and Scotland, grouped alphabetically in counties and with brief details of local societies and any particularly relevant books. Concise instructions on routes, Ordnance Survey one inch map references, details of how to obtain permits and help with local accommodation where likely to be required, are all given. The most interesting regular species of each area are listed under seasonal headings. Passage migrants and unusual or localised winter visitors are also indicated. Fortunately, the author agrees that breeding birds should be disturbed as little as possible and those who buy this book to find rare breeders will have wasted their money. Others, however, will find it a most valuable guide which will increase the pleasure and scope of their bird-watching and their money will be well spent.

D.F.W.

Birds of Australia. Volumes I and II. Text by A. Rutgers, illustrations from lithographs by John Gould. Each volume pp. 160, with 80 colour plates. 1967. 35/- per volume.

These two volumes are yet more examples of large, sumptuously illustrated books on birds which are appearing in increasing numbers. The two books are little more than collections of colour reproductions taken from lithographs by John Gould, the great nineteenth-century English bird artist. They were originally published in Gould's mammoth work *The Birds of Australia*, which contained some 600 illustrations and filled seven volumes. Some species from New Zealand and New Guinea were included.

Altogether 160 species are figured, but only the barest details of range and breeding are given in the text, and in many cases it seems that the author has been hard pressed to find material to fill the page. In a number of instances he has had to resort to his extensive knowledge of the habits and history of the species in captivity to help him out. Gould prepared some of the plates solely from a few specimens sent to him and some of the birds in his illustrations show a peculiarity of proportion and a grotesqueness of posture. In the opinion of this reviewer they do not show the conviction and authenticity of Gould's later work for *The Bird of Great Britain*, published in 1862. There are some fine illustrations of such interesting species as Kakapo, the newly rediscovered Noisy Scrub Bird, and the now extinct Huia. The reproduction, which was done in Holland, is very good, and the whole book is well designed and attractively produced. A publication which will appeal to relatively few, for it's aesthetic quality rather than it's practical value.

M.D.

Natural Selection and Heredity by **P. M. Sheppard**. Third edition. Pp. 192 with 9 figures. Hutchinson University Library, 1967. Paperback 11/6, Hardback 27/6.

This student text deals with heredity in relation to the mechanism of evolution, with especially notable reference to studies on natural polymorphisms. It was first published in 1958, is a lucid and admirable book which has become widely appreciated and deservedly popular, and it scarcely needs any further commendation here. Invaluable for undergraduates, it can be read with profit by anyone interested in the subject.

Those possessing either of the earlier editions will want to know the extent of the present revision. There are numerous minor amendments and additions, too many for all to be mentioned here. The most extensive and perhaps most significant alterations concern the account of industrial melanism in *Biston betularia*, (the Peppered Moth), although those relating to the polymorphisms found in *Cepaea nemoralis* and *Papilio dardanus* are also important and of considerable interest. A most welcome feature is that the present edition is available in paperback form at a price which is considerably reduced in comparison with the original hardback edition of 1958. J.D.L.

Introduction to Experimental Ecology by **T. Lewis and L. R. Taylor**. Pp. xii + 401 with one plate and numerous text figures. Academic Press, London and New York. 1967. 37/6.

The authors clearly state in the introduction to this volume that their aim is to guide the teacher and student through the principles of ecology to a quantitative understanding of the dependence of living animals on their changing environment. It is essentially a practical guide. In the fourth chapter, 45 exercises are described in detail: these consist either of simple experiments or simple planned observations illustrating very diverse aspects of ecology, from behavioural responses, interdependence of species, distribution studies and the assessment of population density, to population changes and community structure. This chapter is well supported by one on tabular and graphical representation of results and on statistical assessments, by another on apparatus and techniques and by a well-illustrated chapter on keys to the major groups of land invertebrates. An extensive appendix incorporates much useful reference material for statistical analyses. The authors are to be congratulated on such a useful practical guide. The incorporation of more references in a future edition would be valuable. The account of exercise 33 for instance is clearly based on Cameron's paper, and although the figure on p. 204 is acknowledged 'after Cameron' I can find no reference to his paper. E.B.

Microecology by **J. L. Cloudsley-Thompson**. Institute of Biology's Studies in Biology Series No. 6. Pp. 48, 1 plate, 15 text figures. Edward Arnold Ltd. Paperback 7/6, Hardback 12/6.

This book describes the various kinds of crevices in which animals live, e.g. the interstices in soils, rotting logs, leaf litter, etc., and larger cavities such as caves and the nests of social insects. Methods of climatic measurement in small spaces are briefly reviewed together with a brief account of some of the animals occurring there and their adaptation for this mode of life. Treatment is straightforward and elementary, although the style is often slipshod and in many places the author slips into banalities as for instance on p. 44 where we are told that 'air humidity fluctuates between wide limits except in microhabitats where a high moisture content is usually retained'. E.B.

Empires in Anarchy by **W. B. Collins**. Pp. 138, with 8 drawings by Rita Parsons. MacGibbon and Kee. 1967. 36/-.

The empires are those of the ants and termites and the species are mainly African. This is an account for popular consumption of some of the more striking features of the ant communities and it includes some of the author's own observations. The driver ants are featured prominently and the book opens with a rather disagreeable account of death by torture. The author stresses the biting, stinging and generally destructive powers of his subjects and one is not left with any feeling of affection for these insects. J.H.F.

Leeds and its Region edited by **M. W. Beresford** and **G. R. J. Jones**. Pp. xviii + 298 with 15 plates, 47 figures and 33 tables in the text. Published by the Leeds Local Executive Committee of the British Association for the Advancement of Science and obtainable from Austick's Bookshop, 21 Blenheim Terrace, Leeds 2. Softback 35/-, Hardback 50/- plus 4/6 postage.

This volume was prepared for the recent British Association meeting and both in format and in the range of information which it contains it makes an interesting comparison with that produced for the last B.A. meeting in Leeds in 1927. The book contains 27 chapters and is divided into four parts. The first part deals with the physical and human setting. Professor Versey, Dr. Bartley and Dr. Broadhead contribute excellent general accounts of the geology, vegetation and fauna of the West Riding. Other articles in this section cover climate, landforms, agriculture and soils, prehistoric archaeology, preconquest history, place names and dialects. The second and third parts deal, in nine chapters, with the growth and development and the present economy of Leeds and its region, and the final section contains six chapters dealing with the contributions of Leeds to medicine, the biological and earth sciences, the mathematical and physical sciences, science in industry and education. It is impossible to do more here than allude to the very wide scope of the subjects dealt with. No one with any interest in local history and affairs or in the sciences and their particular connection with Leeds and the adjacent area, will fail to find this very diverse and comprehensive survey by more than a score of highly qualified contributors, a permanently useful source of information about the town and the region. W.A.S.

Hydrogeological Map of North and East Lincolnshire. Institute of Geological Sciences, London. 1967. 42/-.

In any planning which involves the establishment of new towns or of new industries, it is important to have adequate information about the availability of satisfactory water supplies. Very often the data bearing on this problem are scanty and in recent years, the Institute of Geological Sciences (formerly the Geological Survey) has been carrying out regional studies to remedy this deficiency and this map is the first issued by the Water Department of the Institute. It shows the results of their studies in Lincolnshire where there are three aquifers of major economic importance, namely, the Lincolnshire Limestone, the Spilsby Sandstone and the Chalk. For each of these rocks, the average level of the water-table in the area of outcrop and the pressure surface where the rock is covered are shown. The map is on the scale of half an inch to one mile and is surrounded by diagrams on a smaller scale giving variations in hardness for each aquifer. The particular problem in the Grimsby area where large abstraction of water has led to the infiltration of salt water is illustrated by a larger scale diagram.

A written account of the hydrogeological conditions in the area will be published shortly but the map by itself provides a wealth of information for all those whose prosperity depends on an adequate water supply. H.C.V.

The Peoples of Kenya by **Joy Adamson**. Pp. 400 with 268 paintings, sketches and photographs and end-paper maps. Collins. 4 gns.

Joy Adamson has achieved an international reputation from her books on Elsa and descriptions of animal life in the forests and reserves of Central Africa. But her interests have always been wide and throughout the 30 years she has lived in Kenya, and her very frequent journeyings there and elsewhere in Africa, the peoples amongst whom she travelled and their ways of life have been a constant source of fascination to her. Already an accomplished flower painter, she taught herself to paint portraits and, as the present book amply demonstrates, acquired great skill in depicting, often under difficult conditions, the men and women of the many tribes through whose territories she travelled. The present book is a personal and discursive account of six and a half years spent in travelling to all parts of Kenya for the purpose of painting the men and women, boys and girls, warriors, witch doctors and others with whom she came in contact and recording some of their tribal customs. The book is profusely illustrated by her paintings and photographs and though she modestly disclaims any attempt 'to cross the threshold of anthropology' the record is a considerable contribution to anthropological science as well as being a very readable and unassuming account of the day to day experiences of a versatile, perceptive and courageous woman.

W.A.S.

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THE YORKSHIRE NATURALISTS' UNION

Chislett Memorial Lecture — Preliminary Notice

In view of the Joint Y.N.U.-Y.N.T. Conference at York this coming September, the next Chislett Memorial Lecture will not now be held until 8th March, 1969.

The meeting will be held in the Leeds University Adult Education Centre, 37 Harrow Road, Linthorpe, Middlesbrough. Robert Spencer, ringing officer of the British Trust for Ornithology will speak on 'Progress and prospects in migration research'.

Please make a note of this date.

Ornithological Section

Would members please note that records for Vice-County 63 should now be sent to C. Bower, 17 Woodland Rise, Silkstone Common, Nr. Barnsley, who has succeeded J. Cudworth as Ornithological Recorder for that area.

The R.S.P.B. requests that anyone who discovers any bodies of oiled seabirds report the matter to them. Forms for reporting these are available from the R.S.P.B. at The Lodge, Sandy, Beds.

Annual Subscription 30/- (post free) payable in advance to The Yorkshire Naturalists' Union, The University, Leeds 2.

A STUDY OF A LONG-EARED OWL ROOST

J. S. ARMITAGE

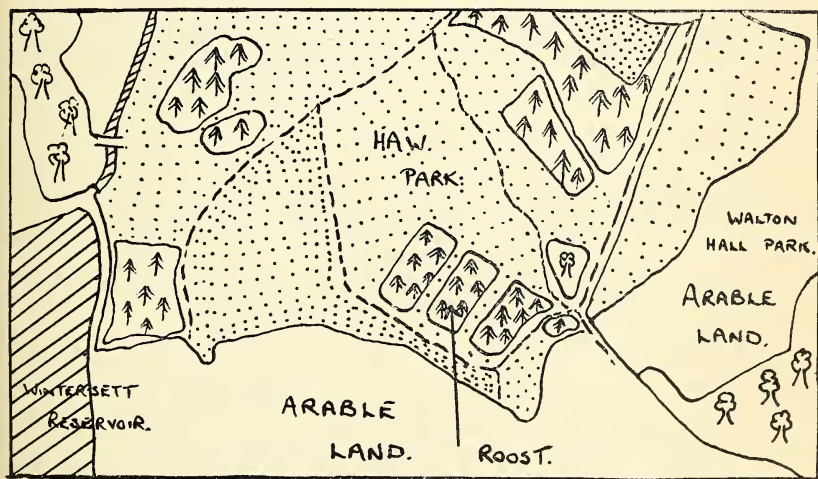
During the months of November–March inclusive in several past years Long-eared Owls (*Asio otus*) have been recorded staying throughout the period, or part of the period, in Haw Park near Wakefield, South Yorkshire. Records of some of these occurrences have been cited previously (see Y.N.U. Ornithological Reports, 1960 and 1962). On the 15th February, 1958, eleven pellets were collected and analysed by the late J. C. S. Ellis, quantitative results for the series being given in the Y.N.U. Ornithological Report for 1958. Further reference to these is made in this paper.

Although most ornithologists will have a general idea of the diet of the Long-eared Owl, much work having been carried out on the Continent and, to a lesser extent, in Britain, I decided to try and find out what species and numbers of prey were caught in the above area and also to collect information on occurrence, hunting methods, pellet formation and ejection, and the general feeding patterns of nocturnal owl species.

The following data is derived from work I undertook in the area during the winters of 1963–4 and 1964–5. The site used during both winters was the same, although in previous winters completely different sites had been used (pers. comm. J. Cudworth) about a half mile to the west.

In assembling this data the following methods were used. Collections of pellets were made at the end of each calendar month in which the birds were resident, wholly or in part. They were then dried and individually analysed and in addition those specimens collected in the second winter, with the exception of fragmented ones, were measured. The mammal remains were identified by using the skull character key given by Southern (1964) and the method adopted of using the skull(s) present as an estimate of the number of prey items (Southern, 1957). The bird prey was identified by T. M. Clegg with the aid of material present at Doncaster Museum. The data on mammal distribution was gained by setting simple back-break traps in the area and by the collection of any relevant visual records. Unfortunately numerical data based on transect line trappings was not collected, so information as to density of, or fluctuations in, populations present within the area is not available. Available literature was tabulated for comparative and factual information.

Map showing various habitats surrounding roosting site.



Scale: approx. 6":1 mile

▲ Conifer Plantations (mature)



Deciduous Woodland, mainly Silver Birch



Stippled areas represent newly-planted conifers about 3–4 years old

— — — — — Footpaths

THE GENERAL HUNTING AND ROOSTING AREA

The roosting sites were situated in the central one of three larch plantations (see map above), being well protected from the wind and, to a certain extent, from human interference. Although the plantation used was the same in both winters the location of the actual roosting sites changed within it. The trees used were within nine feet and twelve feet of the plantation's edge; the width of the plantations was approximately 111 feet and the mean height of the perches eight feet. The birds usually roosted within a few feet of one another unless previously disturbed. The sites described by J. Cudworth in previous winters were radically different, being large pine trees in more open 'stands'.

The rides or gaps between the plantations were approximately forty-eight and sixty-three feet wide respectively and were planted with Japanese Larch (*Larix leptolepis*). These were barely fifteen inches in height in the second winter and gave easy access to open ground from the trees in the plantation, the mean height of which was seventeen feet.

Reference to the map will show that in the afforested area different habitats for mammal populations were present and these probably had a direct influence on the prey species taken at various times. The map represents the area as it was in the relevant winters of 1963-4 and 1964-5. Felling of woodland, growth of the then very young conifers, and even changes in footpaths have since altered the appearance of the area considerably.

The newly planted areas of conifers varied as regards their vegetative cover as they were in different stages of development, some being virtually ploughed-up land with plants only just visible above the furrows and others having young conifers fifteen inches in height. This is particularly significant when the distribution of Short-tailed Field Vole and Long-tailed Field Mouse is taken into consideration, as detailed below.

RELEVANT MAMMAL SPECIES IN THE AREA

As stated previously, no numerical data was collected to determine mammal densities or fluctuations, but the following is rather a synopsis of random trapping and observations made over quite a long period, before, during, and following the study periods.

The most abundant mammal is the Short-tailed Field Vole (*Microtus agrestis*) which, although present in high numbers, especially during the 1964-5 winter, is limited to the surrounding fields and the very young, newly-planted conifers. I have never trapped this species in a mature plantation although they appear to be present in all suitable areas between and adjacent to them. Of all the mammal species this appears the most difficult to trap, although recent use of pitfall traps suggests their being more efficient than the simple back-break ones.

In the autumn of 1966 trapping in areas that, in 1964-5, held young conifers and a Short-tailed Field Vole population now provided more cover and appeared to be supporting Long-tailed Field Mice (*Apodemus sylvaticus*) only. This suggests that the Short-tailed Field Vole evacuates the growing plantations when they reach a certain height, these then being available for colonisation by Long-tailed Field Mice, but that no contestation takes place, initially, by the latter for occupation of the habitat. The changes in these species' population densities might well affect the diet of the Long-eared Owl, if this were studied in the area over a series of winters.

The Long-tailed Field Mouse is abundant in the plantations with tussocky grass and bracken, but due to most plantations being in close proximity to each other a certain amount of transference must occur. The Common Shrew (*Sorex araneus*) appears abundant in all habitats but as this species may be particularly 'trap prone' care must be taken not to rate its numbers too high; however, in neither winter did its numbers appear to fluctuate. The Bank Vole (*Clethrionomys glareolus*) is certainly less abundant than *A. sylvaticus* but it is a little more widespread in its distribution, especially in thick cover alongside fields and the park's boundaries. The Water Vole (*Arvicola amphibius*) and the Water Shrew (*Neomys fodiens*) occur on the fringe of the area, i.e. around Winterset Reservoir, although the latter is sometimes known to spread into less typical habitats, especially woodland. The Mole (*Talpa europaea*) is present and abundant in suitable areas within and surrounding the area. The Brown Rat (*Rattus norvegicus*) is abundant in the surrounding rural area but no actual records are held by me for the area under review.

PAST RECORDS FOR THE SITE

From observations made over the last six winter periods, i.e. from the winter of 1959-60, it would appear that the birds are present in most years, and from records referring to former years (pers. comm. J. Cudworth and W. C. Wakefield) it would seem likely that birds have resided there in winter for a considerable number of years.

Perhaps it is not the dates of arrival and departure which are important so much as their coincidence with records of obviously continental birds on the east coast of Yorkshire. This suggests the birds may be of continental origin, and further perusal of facts from widely different sources tends to support this (Tables 1 and 2).

TABLE I

Autumn arrival dates of Long-eared Owl at Haw Park and some East Yorkshire coastal sites

Year	Haw Park	Spurn	Flamborough	Redcar	Comments on Haw Park site
1957-8	(15/2/58)	16/11/57	—	—	Visit by Ellis
1958-9	No observations	No records	on vessel offshore 20/11/58	—	
1959-60	20/2/60	10/10/59	31/1/60	—	Site first seen by me
1960-1	4/12/60	15/10/60	—	—	Only date birds noted
1961-2	No records	No records	—	—	
1962-3	29/12/62	12/10/62 10/11/62 several	23/12/62	10/11/62	
1963-4	7/3/64	3/11/63 21-9/10/63 several	2/11/63	1/11/63	Roost site changed prob. arrived earlier
1964-5	-/12/64	7/10/64	—	—	

TABLE II

Latest recorded spring dates for Long-eared Owl at Spurn and Haw Park

Year	Haw Park	Spurn
1959-60	23/3/60	5/4/60
1960-1	see Table I	No records
1961-2	No records	No records
1962-3	17/3/63	12-15/4/63
1963-4	11/4/64	No records
1964-5	-/1/65	No records

During the years cited above I have never proved the Long-eared Owl to breed in Haw Park, or even to be present during the period late spring to late autumn. The dates of arrival and departure tend to suggest the birds may possibly be of continental

TABLE III
 Ringing returns of Long-eared Owls
 * denotes birds ringed as nestlings

	Ring numbers	Date of ringing and recovery	Ringing and recovery sites				
1	AH 2411	15/11/59 29/8/61	Newburgh near Stade	: :	57° 19' N. 53° 34' N.	2° 01' W. 9° 37' E.	Aberdeen Germany
2	R C 20751*	9/6/63 27/12/64	Zwönitz South Hetton	: :	50° 38' N. 54° 49' N.	12° 49' E. 1° 27' W.	Germany Durham
3	L 500048*	31/5/59 10/4/60	Wassenar Gotham	: :	52° 08' N. 52° 52' N.	4° 20' E. 1° 12' W.	Netherlands Nottingham
4	L 391526*	20/5/64 7/10/64	Den Helder Spurn	: :	52° 56' N. 53° 35' N.	4° 44' E. 0° 06' E.	Netherlands Yorkshire
5	M D 364176	1/11/59 1/3/60	Ribatschi Beaminster	: :	55° 11' N. 50° 49' N.	20° 49' E. 2° 44' W.	U.S.S.R. Dorset
6	D 176	24/10/34 30/3/36	Ribatschi area (Utrecht)	: :	(55° 11' N.) 52° 08' N.	(20° 49' E.) 5° 10' E.	U.S.S.R. Netherlands
7	? ?	19/10/52 16/3/56	Falsterbo Selby	: :	55° 23' N. 53° 45' N.	12° 50' E. 1° 08' W.	Sweden Yorkshire
8	OB 831. 694	12/11/60 13/1/61	Ottenby, Öland Åkirkeby	: :	56° 12' N. 55° 04' N.	16° 24' E. 14° 56' E.	Sweden Denmark
9	GBG D43681*	28/5/59 -/12/59	Örrefors, Småland Billys-Aisne	: :	56° 48' N. 49° 23' N.	15° 45' E. 3° 20' E.	Sweden France
10	SS 22793	1/11/64 8/11/64	Fair Isle Zandvoort	: :	59° 32' N. 52° 22' N.	1° 37' W. 4° 31' E.	Shetland Netherlands

origin, and information from R. G. Hawley's work on a local breeding population in North Derbyshire supports this if used contrastingly. These latter birds begin claiming territory in February and are usually breeding by late March to early April, a period when the Haw Park birds are still communally roosting, the disappearance of the latter then coinciding with occurrences of birds on the east coast of Yorkshire. The method of roosting also seems to differ radically from known local breeding birds, which never appear to roost communally. Hawley states that even early in the year at a breeding site the adults usually roost some distance apart, often as much as seventy-five yards, and on only two occasions has he found a pair roosting together.

It must be admitted that this deduction is rather tenuous and open to criticism, but it must be remembered that the observations refer to one site only and, as such, cannot be used to generalise from, though the facts seem to suggest the Haw Park birds are not of local origin. Moreover the immigration, in winter, of the Long-eared Owl to Great Britain can be assumed to occur regularly. The ringing results given below lend much support to this, and suggest there is a south-westerly or west-south-westerly movement of the species across the continent of Europe in autumn, although in some instances a direct southerly movement can be noted.

Reference to the few examples in Table 3 show that continental birds do come to Britain in winter even in their first year (examples 3 and 4) and that they appear to remain here in spring after our birds have generally begun breeding although, referring to the dates on which the pulli were ringed, little difference is apparent as regards the timing of the breeding season. As the roosts are used annually, the question the last statement poses as to whether the winter visitors are in the main immature birds, is left open, though one would think certain adults accompany the immature birds in order to locate the roost.

On Fair Isle the species 'occurs almost every year in spring and autumn, more regularly in the latter period, in very small numbers. Spring records are between the 18th February and 26th June, mostly late March to early May, and there are no records of more than two birds. Autumn records in the past fifteen years have all been between 7th October and 8th December, mostly late October and early November, usually single birds but up to eight noted at peak' (Davis, 1965).

USE OF ROOST SITE

Since the winter of 1963-4 the site used has been the same; previous to this an alternative one was used at the opposite side of the plantation. On the three occasions on which I have suspected birds to have arrived within the previous few days, they appeared nervous and were easily disturbed. After being present for a short period however, they can be easily approached, on occasions to within four yards. I have only recorded single birds flying outside the plantations in full daylight on four occasions, this appearing to be leisurely movement between the stands of timber rather than a hunting foray, as usually they remained perched in a conifer unless disturbed.

When the owls were disturbed during the daytime they manifested two methods of dispersal depending, I think, on the severity of the 'fright factor'; either they (1) flew through the trees a short distance and then rose above them to fly into another plantation, if severely disturbed or, (2) 'dropped' between the trees and flew almost at ground level, usually to remain within the plantation a short distance from the original roosting perch if they became aware, for instance, of someone observing them.

The number of birds using the site has varied; during the 1959-60 winter a maximum of five occurred. Four were present on the 4th December, 1960, the only date the species was recorded that winter, but since then the number has not exceeded three.

It is significant that the owls remained in the roost throughout the severe winter of 1962-3 and apparently suffered no hardship, although conditions for catching mammals and presumably the additional energy reserves needed to combat such extreme conditions must have been a problem. On visits to the park during that period, other birds were rarely seen, so that the possibility of their diet being supplemented by preying upon birds was negligible due to lack of supply. During the most severe weather when snow drifts two-three feet deep were present, the birds began to roost very close to the ground, presumably to gain a little more protection, although immediately conditions improved they resumed their normal roosting sites. Unfortunately no work was undertaken during that winter when results would have been invaluable, as far as diet is concerned, for comparison with subsequent relatively mild winters.

ANALYSIS OF PELLETS COLLECTED

During the two winters a total of 99 pellets was collected, 39 in 1963-4 (whole ones only) and 60 in 1964-5 (52 being whole). Unfortunately the birds were not present in either winter for a long period, so the opportunity to examine a long series of pellets did not present itself.

(a) Size

The size of the pellets was found to vary considerably; the results of measuring 52 whole pellets collected during December, 1964 and January, 1965 are given in Table 4.

TABLE IV

Analysis of measurements of 52 pellets of Long-eared Owls, Haw Park, winter 1964-5 and comparative figures of other workers

	MINIMUM			MAXIMUM			MEAN	
	Own	South	Ticehurst	Own	South	Ticehurst	Own	South
Greatest length	1.5 cm.	2.0 cm.	3.6 cm.	5.0 cm.	6.0 cm.	5.0 cm.	2.86 cm.	3.76 cm.
Greatest breadth	1.2 cm.	1.4 cm.	1.9 cm.	2.6 cm.	2.7 cm.	2.1 cm.	1.86 cm.	2.02 cm.

As can be seen from the above, the sizes of the pellets were similar to specimens collected by Ticehurst (1939) and South (1965) in other localities.

(b) Prey content

The 39 pellets collected in the 1963-4 winter contained 55 prey items, or 1.4 per pellet; the 52 whole pellets collected in the 1964-5 winter contained 72 prey items, or 1.38 per pellet. The mean number of prey items per pellet for the series was therefore 1.4 (127 prey items contained in 91 pellets).

Table 5 below shows the number of contained prey items per pellet. It would seem that such figures fluctuate widely, as South (1965) records 31.5% of pellets analysed to contain one prey item only, whilst Ticehurst (1939) records 61%, which emphasises the difference and also compares very closely with the figures derived from both series in Haw Park.

TABLE V

Analysis of pellets of Long-eared Owls, Haw Park, 1963-4 and 1964-5 winters, to show number of contained prey items per pellet

Contained prey items per pellet	1963-4 series	1964-5 series
One item	61.5%	65.4%
Two items	35.9%	25.0%
Three items	2.6%	7.7%
Four items	—	—
No items	—	1.9%

The last item in the table for the 1964-5 series was a small, nearly round pellet containing fur, red shale and a leaf; this was considered to comprise the residues present in the stomach, and subsequently expelled, after a pellet containing an actual prey item had already been ejected. The small quantity of red shale, a covering of

which had been laid along the main tracks within the Park, suggested that this and other owls hunted along the edges of these and either fed there or moved into cover on the other side, as several other pellets contained very small pieces.

The analysis of the prey content of both series can be seen in Table 6, prey items from all pellets being considered in this instance.

TABLE VI

Prey found in pellets of Long-eared Owls, Haw Park, 1963-4 and 1964-5 winters

The figures in brackets are the number of prey items from which the percentages are derived

Prey species	1963-4 series %	1964-5 series %
Short-tailed Field Vole	49.1 (27)	67.9 (55)
Long-tailed Field Mouse	16.4 (9)	17.3 (14)
Bank Vole	20.0 (11)	4.9 (4)
Paridae sp.	3.6 (2)	1.2 (1)
Greenfinch	5.5 (3)	—
Linnet	1.8 (1)	—
Redpoll	—	2.5 (2)
Yellow Bunting	—	2.5 (2)
Passer sp. (prob. <i>P. montanus</i>)	—	3.7 (3)
Indeterminate	1.8 (1)	—
Insect — Carabidae	1.8 (1)	—
	100.0% (55)	100.0% (81)

From the above the general prey type totals can be arrived at as given in Table 7 below.

TABLE VII

Prey type totals of pellet analysis given above

Prey type	1963-4	1964-5
Mammals	85.5%	90.1%
Birds	12.7%	9.9%
Insects	1.8%	—

Although it must be stressed that the number of pellets analysed in both series was small, the results are comparable with and in some cases support statements made by previous workers. Ticehurst (1939) gave 80.1% as the mammal prey present in the pellets he collected from various counties in England, and South (1965) found that mammals formed 86.6% of prey in pellets he collected in South Lancashire.

Uttendörfer (1952) found, in a long study involving 43,000 mammal and 6,000 bird prey items, that Short-tailed Field Vole constituted 47% of the total, Bank Vole

6%, 'mice' 16% and shrews 5%. Except for the latter, these figures correspond very closely with those in Table 6.

Since the choice of prey must be made from that available, differing abundance in different years must cause the prey species and prey type totals to fluctuate. Zimmerman (1950) found that the mammal prey of a German breeding pair fluctuated between 65.5% and 99.5% of the total over a four year period, but in winter roosts I would suggest the minimum value to be much higher than his lower figure, mammal prey constituting upwards of 80%. Presumably leaf fall and diminished vegetation cover generally in autumn serve to expose small mammals sufficiently well to enable owl species to concentrate their hunting on them, although Uttendörfer states that in Germany more birds (12% of the total prey) are taken, due to longer snow cover and, also, that a Short-tailed Field Vole deficit is usually made up by preying on either Long-tailed Field Mouse or birds.

As stated above the general results agree with those presented by previous workers but, in addition, several factors of local interest arise which warrant discussion. But first, it seems relevant to give a general synopsis of actual pellet formation and ejection and its connection with hunting activity, since papers presenting data of this type, save those for academic use only, usually give no details of this, though it is essential to the general reader for a more complete understanding of the topic. Primarily the Long-eared Owl is a nocturnal hunting species with, presumably, maximum times of activity at dusk and towards dawn outside of the breeding season. During hunting forays from the diurnal roost I am inclined to think the bird hunts a specific area, having within it a number of 'resting sites' and throughout the night it remains in the hunting area, where the first meal can be digested before the second is taken.

According to research carried out on the feeding habits of the Short-eared Owl (*Asio flammeus*) by Chitty (1938) it is exceptional for two meals to be taken before the ejection of a pellet. This poses a problem concerning any quantitative analysis deduced from the collection of pellets, as a number approaching even 50% could be ejected away from the roosting sites at a bird's occasional hunting perches. Relevant to the general criterion 'one meal — one pellet', is the state of hunger and therefore the availability of food which determined whether one or two meals should be taken before the ejection of a pellet. Young Tawny Owls (*Strix aluco*), according to Southern (1954), may eject several pellets from one meal, this perhaps being true for the young of all owl species, although in a winter roost one would think the feeding-ejection pattern would have reached an adult state with first-winter birds.

The periods of ejection of pellets are interesting and noteworthy for various species, as they differ somewhat. The Tawny Owl ejects two pellets during the night and rarely any during the day at the 'station diurne'. Guérin, who studied the Barn Owl (*Tyto alba*), has shown that the bird usually ejects two pellets, a 'pelote nocturne' and a 'pelote diurne'. The remains of the prey taken at dusk are ejected at the 'station nocturne' prior to the second meal being taken at dawn, the prey remains from this being ejected at the 'station diurne'.

Chitty shows that in Short-eared Owl the 'pelote nocturne' is likely to be retained longer than the 'pelote diurne'. This could mean that occasional pellets resulting from prey taken at dusk, could be ejected at the roosting site ('station diurne') due to the pellet having been retained in the stomach if there had been no prospect of a meal at dawn due, for example, to hunting conditions being bad. The ejection of a pellet is a conscious not a reflex action so that, if a particular meal has proved insufficient and no other seems immediately likely, the pellet may be retained, the prospect of a meal then hastening expulsion (Chitty, 1938). The actual ejection of a pellet, as recorded by Chitty, is accompanied by a certain amount of obvious nausea. At each ejection the residual contents of the stomach amassed from the previous one, rarely two, meals are expelled more or less completely. Small bones may, however, be retained in the stomach until the formation of a further pellet.

Chitty found that mammals under 10–12 grammes weight were swallowed whole, head first, but larger specimens tended to be eaten by portions. Clegg (pers. comm.), however, thinks that most species of owl could manage whole prey specimens in the region of 20–25 grammes weight, the only selectiveness he has recorded in captive specimens being the removal of the head of certain birds. The ejection of pellets is made necessary by the ingestion of the prey as a whole, and then by certain physical and chemical factors in the birds' make-up.

The prime reason for any owl having to eject bones is the low acid content in the stomach, which does not facilitate their breakdown. In 1928 the Reeds investigated pellet formation in the Great Horned Owl (*Bubo virginianus*) by means of fluorescent examination of ingested food mixed with barium paste. Several extremely interesting facts are given by them, namely: (1) that little or no free acid was present in the stomach contents or in the pellets, the figure given never exceeding 0.437%, (2) the high placement and small size (1 mm.) of the pyloric opening formed a mechanical bar to the passage of any residues and, (3) the flesh was liquefied by very high peptic activity of the gastric juices, the remaining residues, i.e. bones and hair, mixing easily due to the feeble musculature of the stomach.

Thus, from the above facts, some of which, if not all, will be similar in Long-eared Owls, it may be concluded that the length of the period of formation and retention of a pellet varies, the fully formed specimen being ejected at will, its ejection often being intimately connected, it would seem, with environmental influences. Many of the above facts warrant further investigation, comparison being made between one species and another, as little data of this type appears to exist.

HUNTING METHODS AND PREY PREFERENCE

From the data given in Table 6 it can be seen that Short-tailed Field Vole is the most common prey species, obviously because it is the most abundant mammal in the suitable areas adjacent to the roost; these being the arable area to the south and the newly-planted coniferous areas (see map). This shows that most hunting took place over open ground. Long-tailed Field Mouse and Bank Vole appear to supplement the diet to a large degree but Common Shrew, although seemingly abundant in all habitats, was not recorded at all although Ellis (1958) recorded one as being present in the pellets he examined.

In the 1963-4 series Short-tailed Field Vole prey numbers were low, the deficit appearing to be made up by Bank Vole, as the percentages of Long-tailed Field Mouse remained similar in both seasons. Thus it would seem that in the presence of a low number of Short-tailed Field Vole, Bank Vole was preyed upon, as it inhabited more open ground than Long-tailed Field Mouse. The following serves to illustrate another factor that can have a direct effect on the prey content of pellets.

In 1963-4, especially at the end of March and the beginning of April, there were several days when strong or fresh winds were prevalent. Pellets collected during and immediately after this period contained Long-tailed Field Mouse and Bank Vole to a large degree, showing hunting to have taken place in a sheltered habitat, i.e. within the immediate environs of the roosting plantation, as vegetation in exposed places, i.e. in the habitat of Short-tailed Field Vole, was much disturbed. From twelve pellets collected after this presumed 'adverse hunting' period the following data was derived: three pellets contained Bank Vole and Short-tailed Field Vole, four pellets contained Bank Vole and Long-tailed Field Mouse, three pellets contained Bank Vole only, and five pellets contained Long-tailed Field Mouse only. These, I think, show sufficiently well that hunting had been concentrated in a fairly well-vegetated habitat.

On the 2nd April, 1964, during the above period, the birds were seen to leave the roost at 19.05 hours G.M.T., their colours just being discernible. One bird flew immediately to the top of a larch, which was being swayed by a Force 6 easterly wind, but then dropped between the plantations and commenced hunting there. During windy periods such as this the birds appear to rest on or at a low vantage point and watch for prey which is presumably what they do during the night, a point which Hawley has also personally suggested to me.

Usually the hunting technique was a haphazard quartering movement, with slow, deliberate glides about three feet from the ground. On two occasions, however, I have seen a bird of this species using a hovering technique somewhat similar to that of a Kestrel (*Falco tinnunculus*). On the observation date cited above one of the birds flew above a plantation using the wind, remaining stationary for a few seconds over certain points, presumably attracted by Turdidae that were becoming agitated below. These roosting birds did not move out of the trees but were much disturbed by the owl's presence. Subsequently, on the 12th April, 1964, at Spurn Bird Observatory and in the company of W. F. Curtis, I observed a bird hovering over an arable field behind the Warren, a short time after it had been ringed there, the usual hunting technique being reverted to when it was disturbed.

This raises an interesting point, as both Hawley and I think that birds are taken while roosting. Southern (1954) also states that birds taken by Tawny Owls in winter are usually those species that roost near the tops of trees or bushes. Whether, in the first quoted observation above, the bird was attracted by the movement its presence had incurred below, or whether it was attempting to scare out some of the confused birds cannot be decided, but it serves to record that a hovering technique may be used when hunting. Hawley also comments (pers. comm.) that W. E. Gibbs, a Sheffield taxidermist, claims that, in the past, when working in an area of Lincolnshire where Long-eared Owl was common, he has found nests of various small birds including those of Bullfinch (*Pyrrhula pyrrhula*) and Song Thrush (*Turdus philomelos*), in which there were eggs and the head only of the adult. This he attributed to hunting Long-eared Owls. From this, then, it is obvious that much work remains to be done, even in this sphere, to gain a full knowledge of the various techniques involved in the taking of bird prey.

SUMMARY

- (1) Details of a winter roosting site of the Long-eared Owl (*Asio otus*) in South Yorkshire are given, the types of surrounding habitat and mammals present also being described.
- (2) The history of the site is reviewed and the dates of arrival and departure of the birds compared with those of obviously continental birds on the east coast of Yorkshire and in other localities.
- (3) Pellets collected in the winter periods 1963-4 and 1964-5 were measured and analysed and the results compared with those of other workers.
- (4) A synopsis of the general feeding patterns of owls and the formation and ejection of pellets is made, details being drawn from the work of several authorities.
- (5) The prey preference of the Haw Park birds is discussed and certain observed methods of hunting commented upon.

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DOWITCHER AT SETTLE

W. R. HIRST, J. G. IRELAND and F. J. ROBERTS

South of Settle in the West Riding of Yorkshire, the river Ribble meanders through several square miles of flat marshy land between the villages of Rathmell, Wigglesworth and Long Preston. Part of this area (near Wigglesworth Hall) is overgrown with rushes and very marshy, and is kept for duck shooting; the rest is mainly water-meadow. The area is attractive to many species of water birds, particularly when flooded; some standing water is often present, especially in winter. On the weekend of 19–20th August, 1967, when about half of this area was under flood water, fourteen species of wader were recorded, including about two thousand Curlews (*Numenius arquata*), a similar number of Lapwings (*Vanellus vanellus*), about ten Ruffs (*Philomachus pugnax*), a Black-tailed Godwit (*Limosa limosa*), Green and Wood Sandpipers (*Tringa ochropus* and *T. glareola*) and about four hundred duck, mainly Mallard (*Anas platyrhynchos*) and Teal (*Anas crecca*).

On the following Saturday, 26th August, 1967, when both the floods and the numbers of birds were much reduced, W. R. Hirst and J. G. Ireland covered this area. At about 12.00 hrs. (B.S.T.), W. R. H. had a brief glimpse of an unfamiliar wader which landed in a section of private marsh and was not followed up. At about 18.30 hrs., F.J.R. arrived and with J.G.I. met W.R.H., who had just seen again the unusual wader. This time the bird had flushed from a small open pool and flown onto the muddy river-bank some hundreds of yards away. As we approached the river the bird again flushed from under the banking (overhanging at this point), with a Greenshank (*Tringa nebularia*), at quite close range — about 40 yds. Although the sky was mainly cloudy at this time, the sun was shining, and we had a good view of the two birds in flight together, with the sun behind us, as they flew away and finally dropped again onto the river bank about a mile further north. Both birds called continuously. We had a further view, at less than ten yards range, as the bird was disturbed, again with a Greenshank, from a muddy stretch under an overhanging bank where three or more Greenshanks appeared to be roosting. The light had deteriorated greatly by this time (about 20.00 hrs.) as the sky had clouded heavily, and no further details could be determined. The call was again heard. We retired, hoping the bird would roost overnight here.

DESCRIPTIONS:

W.R.H. (8 × 40 binoculars):

“Seen only in flight on four occasions. The general impression was of a very dark bird both above and below. Size — just smaller than Greenshank, more compact, and less lanky. The legs did not project so far beyond tail as Greenshank. Upperparts — dark brown, sometimes looking blackish; this colour appeared patchy, not a uniform colour. Rump, and far up back, white. Tail did not look white as in Greenshank but was noticeably in contrast with rump: it appeared brownish, but lighter than rest of upperparts. Underparts — a very dark rich brown colour, again patchy. Head slightly paler.

Call-note highly distinctive — not so fluty as Greenshank, of a higher pitch, harsher and more rapid. Rendered as ‘kri, kri’ or ‘krik, krik’. Sometimes a triple call, more usually double.

The flight was fairly slow with regular wing beats, similar to Greenshank. When disturbed it flew long distances before pitching and called regularly.”

J.G.I. (10 × 50 binoculars):

“Seen twice in flight with Greenshank.

A wader similar in size to Redshank (*Tringa totanus*), i.e. rather smaller than Greenshank. In flight the bird had an area of white on the back extending down onto the rump, and appearing to merge with brownish blotching on the upper tail-coverts. The tail looked very dark. The underparts were a deep red-brown colour. The legs extended only a very short distance behind tail. Call ‘ku-ku’, not fluty as Greenshank.”

F.J.R. (10 × 50 binoculars):

"Bird seen in flight with a Greenshank. Very *Tringa*-like in shape and actions. Compared with Greenshank, rather smaller, plumper, generally less rakish; feet only just showing beyond tail. Bill longish, similar to Spotted Redshank (*Tringa erythropus*) in length. Plumage — overall very dark coloured, reminiscent at a distance of Spotted Redshank in 'black' breeding plumage. Upperparts and wings dark brown, mottled and barred with paler markings. Underparts — a deep rusty colour. Head and upper breast paler. Rump white, and white extending to a patch on the back, producing, when viewed from the side, the unusual effect of a white line leading between the wings. Tail dark (apparently heavily barred) — unlike the Greenshank, which gave the impression of a white tail. Flight, with quite regular, even, wing-flaps, much as Greenshank.

Call — a rapid 'krkk, krkk'; usually two, sometimes three notes, grating and croaking, more rapid than Greenshank and not musical as that bird. This call was used continually when the bird was flushed; no other note was heard."

J.G.I. and F.J.R. returned the following morning, 27th August, when the weather was calm, fairly clear and sunny. At about 09.00 hrs. (B.S.T.), F.J.R. located the bird feeding alone on a marsh pool at about 70 yds. (measured by pacing later). He was able to watch the bird through 10 × 50 binoculars for about a minute, while it stood anxiously in the water. Finally it relaxed and began feeding again. As F.J.R. approached further, under cover, the bird flew off calling and finally dropped again (apparently) on a marsh about a half-mile to the north. (J.G.I. was on the opposite side of the river about a quarter-mile away and did not see the bird.)

The next twelve hours were spent in searching the area but the bird was unfortunately not seen again. We were unable to contact J. R. Mather, our usual arbiter on ornithological matters, after several telephone calls; but as the bird was apparently absent in any case we did not contact other observers for confirmation.

When seen on the ground, the bird had a plump appearance, with neck drawn in and bill pointing downwards. It seemed about the size of a Redshank (although no other birds were available for comparison), but more compactly built. From a distance the bird appeared blackish; on inspection through binoculars the plumage details were easily made out. The back was blackish, the feathers with noticeable rusty or orangy tips and edgings. The underparts were a rusty colour, marked with black, becoming a deep rich rusty-brown on the flanks, giving the bird a 'bronzed' appearance in the sunlight (shining from behind the observers). The belly and under-tail were not clearly seen. The head, neck and upper breast provided a marked contrast to the rich colouring of the rest of the body, as these parts were shades of grey. Crown and back of neck medium grey: sides of head, throat, etc., and upper breast paler. There was a conspicuous pale eyestripe. The bill was long and straight, similar in length to spotted Redshank, but heavier; the basal half was pale, the tip dark. The bird was standing in water so that neither the length nor the colour of the legs could be determined. (The water was fairly shallow at this point, however, and a bird with longish legs, e.g. Spotted Redshank, would probably have shown a length of leg above the surface). The white on the back was not visible. As the bird began to feed, the neck was craned forward and the head held high with the bill downwards at a steep angle, while the bird took short steps forward. The bill was occasionally pushed into the water and moved up and down in the manner of a Godwit, before the bird moved on. When the bird flushed, its call and flight pattern were observed to be as before.

From the description we were able to identify the bird as a North American Dowitcher (*Limnodromus* sp.), apparently an adult moulting from summer plumage. I. C. T. Nisbet (in *British Birds*, 54 (9), 352), says that in North America, the call is regarded as the best identification mark between the two species of Dowitcher. Our bird had a call very similar to that described by Nisbet for the Short-billed Dowitcher (*Limnodromus griseus*). As the conditions precluded the observation of the other diagnostic structural and plumage features discussed in the paper, however, we felt unable to identify the bird specifically.

On Aggression by Konrad Lorenz. Pp. xiii + 273. Methuen, University Paperback edition. 10/6.

This important book (reviewed in *The Naturalist* 33, 1967), by an author who is as notable for the lucidity of his writing as for his penetrating mind is now available as a University Paperback.

THE LEPIDOPTERA OF YORKSHIRE

(continued from 1967, p. 96)

Apamea crenata Hufn. (Clouded Bordered Brindle).

Both forms are common and widely distributed.

A. lithoxylea Fabr. (Light Arches).

Widely distributed and often common.

A. sublustris Esp. (Reddish Light Arches).

There are only two records in the last thirty years.

61. Everingham, common in the early 1900's; Thixendale, one at sugar, 2nd July, 1964.

64. Askham Bog, in numbers in the 1920's, but not again until July, 1965.

A. zollikoferi Frey. (Scarce Arches).

Several of the handful of British specimens of this rare migrant have occurred in the county.

62. Near Middlesbrough, 26th September, 1903.

63. Methley, 12th August, 1910.

64. Kirkstall, 15th August, 1939.

A. monoglypha Hufn. (Dark Arches).

Generally one of our commonest moths.

A. hepatica Hubn. (Clouded Brindle).

Not at all common but occurs in small numbers in widely separated localities.

61. Osgodby, July, 1963; near Selby, occasional at sugar.

62. Pickering, several, 29th June, 1963.

63. Barnsley, 1905; Sheffield, 1955 and 1956.

64. Harrogate, 1957 and 1960; Knaresborough, 1962; Gateforth Woods near Selby, 11th July, 1963.

A. scolopacina Esp. (Slender Brindle).

Taken in small numbers, mainly in the wooded areas of the West Riding, but seldom referred to as common.

63. Birkinshaw, 17th August, 1966; Halifax; Little Horton, 7th August, 1960; Deffer Wood, 1910 and 1957; Sheffield, common in some years, e.g., 1955; Skelmanthorpe, 1926; Wakefield, 1908; Wath-on-Deerne, 15th July, 1958.

64. Bishop Wood, 28th August, 1955; Brayton Barff near Selby, 1930; Harrogate, 1957 to 1960; Knaresborough, 1962; Selby area, 7th August, 1956.

A. ypsilon Borkh. (Dingy Shears).

Occasionally recorded as common in a district but it appears to be very local.

61. Selby area, larvae not uncommon on Willow.

63. Little Horton, at light, 26th July, 1959; Sheffield, fairly common; Skelmanthorpe.

64. Leeds, at light; Harrogate, one, 4th August, 1957.

Aporophyla lutulenta Borkh. (Deep Brown Dart).

Only seen in the Doncaster area since the Second World War until reported near Filey in 1966.

61. Muston near Filey, three, 14th to 23rd September, 1966.

62. Ayton, 1906; Scarborough, 1914.

63. South of Doncaster, 1930's and 1940's; Rossington Bridge, 18th September, 1959.

A. nigra Haw. (Black Rustic).

Although common in parts of Westmorland this moth has been recorded only once in Yorkshire in the past fifty years.

63. Near Bradford, one, 12th September, 1964.

Dasyptolia templi Thunb. (Brindled Ochre).

This moth used to be widespread and not uncommon, but it is now very seldom recorded in the county except on the East Coast.

61. Muston near Filey, regularly at light, several in October, 1966.

62. York area, not since the early 1930's; Farndale Moor, six at light, 18th October, 1960? (1966, *Entomologist's Rec. J. Var.*, 133); Scarborough, regularly at light in recent years.

63. Low Moor, Bradford, up to 1935; Sheffield, three, 7th and 14th October, 1957 and 6th October, 1958.

64. Barlow near Selby, one male 29th September, 1953.

Antitype flavicincta Fabr. (Large Ranunculous).

Like the last species, it is seen much less now than in the early part of the century.

62. Northallerton, one, 1st October, 1945; Robin Hood's Bay, larvae, 20th July, 1946; York district, up to the early 1930's.

63. Huddersfield, not since about 1924; Wakefield, one, 15th September, 1958.

64. Elland, one, September, 1948, and in earlier years.

A. chi Linn. (Grey Chi).

Widely distributed, mainly on higher ground.

63. Little Horton, often common; Sheffield, common; Selby district, not common.

64. Harrogate, not uncommon; Malham.

65. Meltham, Richmond.

Griposia aprilina Linn. (Merveille-du-Jour).

Not uncommon among Oaks and frequently taken by digging for pupae.

61. Selby, not common; Skipwith.

62. Buttercrambe, 1933.

63. Sheffield, uncommon; Shipley Glen; Skelmanthorpe; Mirfield, 1922.

64. Bishop Wood; Bolton Abbey; Grassington; Harrogate; Knaresborough.

Meganephria oxyacanthae Linn. (Green Brindled Crescent).

Generally distributed and often common with a fair proportion of the melanic form.

Brachionycha sphinx Hufn. (Sprawler).

Fairly well distributed in the eastern and northern parts of the county but very few records in the West Riding.

61. Escrick Park, 1917.

62. Buttercrambe; near Malton, one larva, 1960; Sand Hutton; Newton Dale, Pickering, larvae, 1932.

63. Edlington Wood, 1919; Stutton, Tadcaster, 1957.

64. Bolton Abbey, one larva, 1953; Knavesmire Wood, York.

65. Richmond area.

Euplexia lucipara Linn. (Small Angle-shades).

Generally distributed and often common, particularly among ferns and bracken.

Phlogophora meticulosa Linn. (Angle-shades).

Found all over the county and often common in the autumn.

Celaena haworthii Curt. (Haworth's Minor).

Evidently abundant on most moors where Cotton Grass (*Eriophorum vaginatum*) grows freely.

61. Skipwith Common, abundant.

63. Little Horton, near Bradford; moors near Sheffield; Thornton Moors, near Denholme; Triangle, near Halifax.

64. Rombald's Moor; Ribble Head; Pen-y-ghent.

C. leucostigma Hubn. (Crescent).

Widely reported but never very plentiful and often only taken singly.

61. Kilnsea; Skipwith Common, occasionally.

63. Doncaster, August, 1939; Elland, 1948; Sheffield, one only, before 1959; Skelmanthorpe, 1920; Triangle, near Halifax, one in 1964; Wakefield, one, 20th August, 1956.

64. Askham Bog, not infrequent.

Phalaena typica Linn. (Gothic).

Generally distributed and often common.

Hydraecia oculea Linn. (Common Ear).

The group of four species known as 'Ear Moths' were not separated in the earlier records and their separation remains difficult so that their individual status are difficult to assess. *H. oculea* appears widely distributed, being recorded regularly at Bradford (63) and Sheffield (63) as well as on the coast (61).

H. lucens Frey. (Large Ear).

This is now known to occur widely on the moors; it was first recorded in 1923 at Everingham (61) by Maxwell Stewart.

61. Barlby, 2nd September, 1964; Everingham; Skipwith Common, regularly.

63. Sheffield moors, common; Thorne Moor, 4th September, 1964.

64. Harrogate, 13th September, 1960; Malham Tarn.

H. paludis Tutt (Saltern Ear).

This was also recorded from Everingham (61) in 1923 by Maxwell Stewart. It is now only known to occur at Spurn (61), an ideal habitat for this species.

H. micacea Esp. (Rosy Rustic).

Generally common and very widely distributed. The larvae have been recorded on tomato plants at Little Horton near Bradford (63).

H. petasitis Doubl. (Butterbur).

This species is well distributed among its food-plant which often grows abundantly on river banks, etc. Single specimens are frequently taken at light well away from the natural habitat.

63. Derwent Valley; Elland; Little Horton, near Bradford; Sheffield.

64. Copgrove, two, 1st September, 1958; Harrogate, one, 31st August, 1957 and two in September, 1959; Thorpe Willoughby near Selby 21st August, 1959.

Gortyna flavago Schiff. (Frosted Orange).

Generally distributed and often common.

Nonagria algae Esp. (Reed Wainscot).

Not recorded since Porritt's List.

N. typhae Thunb. (Bulrush Wainscot).

Occurs fairly plentifully wherever the food-plant grows. Larvae and pupae are readily found in the stems of *Typha* while the moths sometimes come to light well away from the breeding ground.

61. Selby district, frequent.

62. Strensall Common.

63. Sheffield; Wath-on-Dearne.

64. Askham Bog; Harrogate; Knaresborough.

N. dissoluta Treits. (Brown-veined Wainscot).

This species was added to the county list by Rev. Ash who took it at Scarthingwell (64) in 1920. It has since been taken in several localities in the Plain of York, but it is unlikely to be detected unless specifically searched for among reeds.

61. Riccall, larvae in 1940; Skipwith Common, 1955 and 1956.

62. Strensall Common, 1938 and 1960.

64. Scarthingwell, both forms plentiful in 1960.

Coenobia rufa Haw. (Small Rufous Wainscot).

There is only one record since Porritt's List, a single specimen at light at Kilnsea Warren (61) in July, 1953. This is another Wainscot with a very restricted flight which should be searched for among its food-plant, *Juncus articulatus* (Jointed Rush).

Chilodes maritima Tausch. (Silky Wainscot).

The first county record was by Arthur Smith who took it at Strensall Common (62) in about 1938. From 1953 onwards it has been recorded fairly regularly in a large reed bed on Skipwith Common (61).

Arenostola pygmina Haw. (Small Wainscot).

Well distributed and often common, particularly in moorland areas.

A. elymi Treits. (Lyme-grass Wainscot).

This coastal species is recorded regularly from the Spurn and Kilnsea area (61).

The only other record is from sandhills three miles south of Bridlington (61) in 1914.

A. phragmitidis Hubn. (Fen Wainscot).

There are a number of well established localities, mainly in the Plain of York.

61. Skipwith Common; Spurn.

62. Strensall Common.

64. Askham Bog.

Rhizedra lutosa Hubn. (Large Wainscot).

Widely distributed among reeds, but often taken at light well away from the nearest reed-bed.

61. Barlby; Brayton; Skipwith Common.

62. Buttercrambe, 19th September, 1933; Northallerton, 3rd October, 1945.

63. Bradford; Halifax, 2nd October, 1959; Sheffield; Wakefield; Wath-on-Dearne.

64. Askham Bog; Harrogate, 4th September, 1958; Headingley.

Leucania pallens Linn. (Common Wainscot).

Generally common and widely distributed.

L. impura Hubn. (Smoky Wainscot).

Also common and widely distributed.

L. straminea Treits. (Southern Wainscot).

This species was added to the county list in 1950 when specimens taken by Arthur Smith at Askham Bog (64) were so identified. It has been confirmed from there more recently and a second locality established: Skipwith Common (61).

L. pudorina Schiff. (Striped Wainscot).

Only three localities have been reported, but in at least two of these it is abundant.

61. Skipwith Common, plentiful.

62. Scarborough, June, 1960.

64. Askham Bog, common.

L. obsoleta Hubn. (Obscure Wainscot).

This was added to the list when J. Briggs and C. R. Haxby took a single specimen at Skipwith Common (61) on 30th June, 1957. It has since been found there in some numbers on several occasions and a second locality has been found: Thorne Moor (63), 9th June, 1962.

L. littoralis Curt. (Shore Wainscot).

The only records since Porritt's List are from Kilnsea and Spurn (61). Two were taken on 1st and 8th July, 1950 and it was not seen again until one was taken on 24th July, 1966 at the Y.N.U. field meeting.

L. comma Linn. (Shoulder-striped Wainscot).

Widely distributed but evidently not as common as might be expected.

61. Skipwith Common; Selby.

63. Elland; Gaisby; Halifax; Little Horton; Sheffield; Wath-on-Deane.

64. Burley Woodhead; Harrogate; Kirkstall.

L. unipuncta Haw. (White-speck Wainscot).

This rare migrant was added to the county list when one was recorded by P. Winter at Filey (61) on 23rd September, 1966.

L. lithargyria Esp. (Clay).

Generally distributed and often reported as common.

L. conigera Fabr. (Brown-line Bright-eye).

Also widely distributed, but not generally as common as the last species.

61. Selby district; Spurn.

63. Gaisby; Little Horton, unusually plentiful in 1953; Sheffield.

64. Askham Bog; Bishop Wood, one 2nd October, 1954, presumably a partial second brood; Harrogate, occasionally.

Stilbia anomala Haw. (Anomalous).

Most recent records are from Upper Grass Wood (64) where it is taken regularly. Until 1966 there were only two other records since Porritt's List.

63. Saltaire, until about 1900.

64. Baildon Moor, 7th August, 1966; Grassington, frequently; Malham Tarn, 12th August, 1966.

65. Sedbergh, 1927.

Meristis trigrammica Hufn. (Treble Lines).

Not as widely distributed as might be expected, but not uncommon in some districts.

61. Kilnsea, once.

62. Pickering; Strensall.

63. Doncaster, regularly, 1914 to 1939; Sheffield, fairly common; Skelmanthorpe; Wombwell, 1960.

64. Harrogate; Knaresborough.

Caradrina morpheus Hufn. (Mottled Rustic).

Widely distributed and generally common, never very numerous but appears steadily over a fairly prolonged period.

C. alsines Brahm. (Uncertain).

Difficult to separate from the next species, it is probably more widespread than the records suggest.

61. Skipwith Common.

63. Sheffield.

64. Harrogate.

C. taraxaci Hubn. (The Rustic).

Apparently commoner and more widespread than the last species.

61. Selby district; Spurn, 1953.

63. Little Horton, near Bradford; Sheffield, common.

64. Harrogate.

C. clavipalpis Scop. (Pale Mottled Willow).

Generally distributed and sometimes common.

Laphygma exigua Hubn. (Small Mottled Willow).

This migrant reaches the county in certain years, 1959 being the most recent good one.

63. Huddersfield, 7th September, 1959; Keighley, eight in 1903; Triangle, near Halifax, 11th and 31st October, 1959.

64. Harrogate, 3rd October, 1959.

Petilampa minima Haw. (Small Dotted Buff).

Fairly widely distributed but only common in a few localities.

61. Hunmanby, 1922; Kilnsea Warren, plentiful in 1954; Skipwith Common.

62. Strensall Common.

63. Little Horton, regularly; Sheffield, fairly common; Skelmanthorpe, common in 1908.

64. Askham Bog; Barlow; Drax; Harrogate, common.

Hydrillula palustris Hubn. (Marsh Buff).

Not recorded since Porritt's List.

Rusina umbratica Goeze. (Brown Rustic).

Widely distributed and often common in the central plain but seldom recorded from the higher ground.

61. Selby district, fairly common in wooded parts; Skipwith Common, very common.

62. Buttercrambe, common on 11th June, 1966.

63. Haw Park, Wakefield, 1912; Sheffield, common.

64. Harrogate, one in 1958 and one in 1961.

Amphipyra pyramidea Linn. (Copper Underwing).

There have been only five records since Porritt's List.

63. Sheffield, one on 4th September, 1956 and one in September, 1966; Triangle, near Halifax, one in August, 1964.

64. Gateforth, near Selby, one on 23rd September, 1937; Harrogate, one on 10th September, 1965.

A. tragopogonis Linn. (Mouse).

Common and generally distributed.

Cosmia affinis Linn (Lesser Spotted Pinion).

A rather local insect which is usually taken as larvae.

61. Muston, near Filey, one in August, 1967; Pocklington, one larva in 1961.

62. Malton, larvae on 29th May, 1967; Sinnington, several larvae, 1946.

63. Cawthorne, 1910; Doncaster, larvae, 1949; Edlington Wood, larvae common in 1919.

64. Copgrove, larvae fairly common in 1959.

C. diffinis Linn. (White Spotted Pinion).

Only recorded once since Porritt's List.

64. Knaresborough, 29th July, 1955.

C. trapezina Linn. (Dun-bar).

Generally distributed and often common in wooded areas, but less frequently taken in the Leeds-Bradford-Huddersfield area.

Enargia paleacea Esp. (Angle-striped Sallow).

Often taken quite freely on the low lying heaths where there is a good growth of mature birch; there are also other records from quite widely separated districts.

61. Allerton Common; Skipwith Common, plentiful.

62. Buttercrambe Woods, 1939; Strensall Common, plentiful.

63. Deffer Wood, 1900-7; Doncaster, one 29th August, 1939; Little Horton near Bradford, one 19th August, 1964; Sheffield, often common.

Zenobia retusa Linn. (Double Kidney).

Only recorded from two localities since Porritt's List.

61. Ricall, larvae on Willow, 15th June, 1940.

64. Askham Bog, early in the century but none since.

Z. subtusa Fabr. (Olive Kidney).

Much more widespread than its co-gener but seldom taken in any numbers.

61. Selby district, occasionally.

63. Bretton near Wakefield, larvae common in 1916; Deffer Wood, two 31st

July, 1957; Sheffield, not common; Shelley Woodhouse, 1920; Wakefield, one 20th August, 1956.

64. Bishop Wood; Gateforth; Harrogate, three 1957-65; Kirkstall, three in 1956.

Gypsites leucographa Hubn. (White Marked).

This species is still taken regularly in Bishop Wood (64) by working Sallow bloom in April. There is only one other record since Porritt's List, a few being taken at Sallow in 1905 near Middlesbrough (62).

Cerastis rubricosa Fabr. (Red Chestnut).

Widely distributed and sometimes common.

Panolis flammea Schiff. (Pine Beauty).

Well distributed wherever there is plenty of pine.

61. Allerthorpe Common, 1935; Skipwith Common.

62. Buttercrambe, 1933; Strensall Common.

63. Deffer Wood, 1954; Sheffield, fairly common.

64. Bishop Wood; Harrogate; Knaresborough.

Orthosia gothica Linn. (Hebrew Character).

Generally distributed and often very common.

O. miniosa Fabr. (Blossom Underwing).

Not recorded since Porritt's List.

O. cruda Schiff. (Small Quaker).

Widely distributed but not as common as most of the other members of the genus.

61. Skipwith Common.

62. York district.

63. Halifax; Sheffield.

64. Bishop Wood; Harrogate.

O. stabilis View. (Common Quaker).

Widely distributed and often very common.

O. populeti Treits. (Lead-coloured Drab).

Only recorded from two districts apart from its stronghold in Bishop Wood (64).

62. York district, 1933.

64. Bishop Wood, regularly at light, sugar and Sallow bloom; Gateforth near Selby.

O. incerta Hufn. (Clouded Drab).

Generally distributed and often very common.

O. munda Esp. (Twin-spot Quaker).

Widely distributed but by no means common, usually reported in very small numbers.

62. York district, at Sallow bloom in 1933.

63. Deffer Wood, scarce in 1910; Edlington and Wadworth Woods, larvae abundant in 1919; Sheffield, scarce in the 1950's.

64. Bishop Wood, regularly; Harrogate, occasionally.

O. advena Schiff. (Northern Drab).

Not widely reported and of rather irregular appearance where it is taken.

63. Sheffield, scarce.

64. Bishop Wood, not common; Harrogate, occasionally; Thorpe Cuttings near Selby.

O. gracilis Fabr. (Powdered Quaker).

Well distributed but not often common except in the south-eastern part of the county around Selby (61 and 64).

Atethmia xerampelina Hubn. (Centre-barred Sallow).

Fairly well distributed wherever there is plenty of Ash, on which the larvae are taken in the spring.

Omphaloscelis lunosa Haw. (Lunar Underwing).

Local and apparently preferring the low-lying areas towards the south and east. It has not been recorded from such well worked areas as Bradford, Halifax and Harrogate.

61. Barlby, September, 1966; Filey, common in 1966; Kilnsea; Selby district; Skipwith Common.

62. Middlesbrough, 1906; Strensall Common; York district.

63. Sheffield, common.

Parastichtis suspecta Hubn. (Suspected).

Widely distributed and sometimes quite common.

61. Skipwith Common.

62. Strensall Common.

63. Sheffield; Skelmanthorpe, 1906 to 1914; Wakefield 23rd July, 1946.

64. Askham Bog; Harrogate, three 1958 to 1961; Kirkstall, two in 1946; Morton's Bog, near Selby.

Agrochola lota Clerck. (Red-line Quaker).

Widely distributed, particularly among Willows and Sallows, but not often really common.

A. macilenta Hubn. (Yellow-line Quaker).

Rather more local than the last species but widely distributed, particularly in well wooded areas.

A. circellaris Hufn. (Brick).

Generally distributed and often common, except perhaps in industrial areas.

A. lychnidis Schiff. (Beaded Chestnut).

Widely distributed and often common.

Anchoscelis helvola Linn. (Flounced Chestnut).

Widely distributed and often common though not as numerous as the previous species.

A. litura Linn. (Brown-spot Pinion).

Generally common and widely distributed except in some industrial areas.

Tiliacea citrargo Linn. (Orange Sallow).

Well distributed and sometimes common as larvae among well established Limes.

61. Skipwith Common.

63. Doncaster; Skelmanthorpe.

64. Gateforth; Harrogate; Leeds district.

T. aurago Fabr. (Barred Sallow).

Widely distributed but not often common. Occurs mainly on Beech but also on Maple and possibly Sycamore.

63. Deffer Wood; Sheffield; Womersley, 1936.

64. Acaster Malbis near York; Brayton; Gateforth; Headingley; Knaresborough; Malham, 1939.

Citria lutea Stroem. (Pink-barred Sallow).

Well distributed wherever Sallows grow freely but not so common as the next species.

Cirrhia icteritia Hufn. (Common Sallow).

Generally common and widely distributed, most plentiful as larvae on Sallow bushes in the spring.

C. gilvago Esp. (Dusky Lemon Sallow).

Widely distributed among Elms on which the larvae are often numerous.

61. Skipwith.

62. Malton district, larvae, 29th May, 1967.

63. Sheffield.

64. Brayton; Burley Woodhead; Burton Leonard; Elland; Gateforth; Harrogate; Knaresborough.

Comistra vaccinii Linn. (Chestnut).

Generally distributed and often common in wooded areas.

C. ligula Esp. (Dark Chestnut).

Fairly widely distributed and sometimes common, particularly in the eastern part of the county.

61. Beverley, 5th October, 1967; Selby district.

62. Scarborough, 14th October, 1967.

63. Sheffield; Skelmanthorpe, 1913.

64. Burley Woodhead, 1960; Selby district, often common in autumn; Tadcaster, frequent at Ivy bloom.

Eupsilia transversa Hufn. (Satellite).

Well distributed and sometimes common in well wooded areas.

Graptolitha ornitopus Hufn. (Grey Shoulder-knot).

Not recorded since Porritt's List until one was taken at light at Sheffield (63) in September, 1965.

Lithomoia solidaginis Hubn. (Golden Rod Brindle).

Not uncommon on some of the higher moors where Bilberry grows freely.

62. Middlesbrough, 1905.
63. Meltham Moor, on tree trunks; Penistone, common in 1908; Pye Nest near Halifax, 1955; Sheffield Moors.
64. Burley Woodhead, 1960; Grassington, 1932; Ilkley, at Cow and Calf Rocks, 1957.

Xylocampa areola Esp. (Early Grey).

Not recorded as often as would be expected, it is certainly local and seldom common.

61. Cliffe Common, one in 1963; Skipwith Common, formerly.
62. Goathland, 1952; Wykham near Scarborough, 1943.
64. Bishop Wood, sometimes frequent; Copmanthorpe near York, 1959; Harrogate, occasionally; Washburndale, three in 1950.

Xylena exsoleta Linn. (Sword Grass).

This species used to be taken quite frequently but since the second World War has been very scarce with only three scattered specimens taken in the autumn of 1960.

61. Everingham, 20th October, 1923; Holme-on-Spalding Moor, one at sugar 22nd October, 1960.
62. Buttercrambe, October, 1933; Scarborough, common at Oliver's Mount, 16th October, 1938 and a few in Raincliffe Woods in March, 1940.
63. Doncaster, frequently up to 1940 when it was common in October, two in October, 1945; Sheffield, occasionally.
64. Harrogate, one at M.V. light, 7th October, 1960; Kirkstall, November, 1943; Scarthingwell, one at Ivy bloom 15th October, 1960; Selby district, before 1940.

X. vetusta Hubn. (Red Sword Grass).

Apart from a few specimens in the Sheffield area (63) in the late 1940's and early 1950's this moth has not been recorded since the end of World War II.

61. Skipwith, 1932.
62. Middlesbrough, 1905; Northallerton, one larva in 1945; Seamer, one larva in 1943.
63. Sheffield, scarce.
64. Askham Bog, larva in 1921; Kirkstall in 1940.

Cucullia verbasci Linn. (Mullein).

Widely reported from a range of localities almost invariably as larvae.

61. North Cave, 1953.
62. Northallerton, 1945; York district in 1960.
63. Bingley, 1938; Bradford, 1939; Huddersfield, 1918; Shipley Glen, 1943.
64. Boroughbridge, 1942; Huby, 1950; Kirkham Abbey, 1920 and 1958; Saxton, 1922; Selby district, 1960's; Wentbridge, 1916.

C. asteris Schiff. (Starwort).

This species was added to the county list when larvae were found at Kilnsea (61) by H. N. Michaelis in August, 1949. This remains the only known locality but larvae have been taken there regularly since that date and were not uncommon on *Aster tripolium* on the occasion of the Y.N.U. field meeting on 24th July, 1966.

C. umbratica Linn. (Common Shark).

Well distributed but not often common; this is the only member of the genus which is usually taken as a moth rather than as a larva.

61. Kilnsea, not uncommon; Selby district, occasionally.
63. Beeston, 1945; Gaisby, two in July, 1954; Halifax, two in July, 1959; Little Horton, near Bradford; Sheffield.
64. Burley Woodhead, several on 26th June, 1960; Harrogate; Knaresborough, 18th July, 1958.

C. chamomillae Schiff. (Chamomile Shark).

Widely distributed and sometimes taken at light in the spring. Working for the larvae will often establish that it is much more plentiful than it otherwise appears.

61. Kilnsea.
63. Little Horton; Sheffield; Wakefield.
64. Barlow; Bishop Wood; Boroughbridge; Brayton, one at light on 3rd October, 1959, a most unusual date; Selby district.
65. Dishforth, larvae, 1962 and 1965.

(to be continued)

THE PHYTOPLANKTON OF ROSTHERNE AND MERE MERES, CHESHIRE

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Rostherne Mere, Cheshire (National Grid Reference SJ 745843) is a lake of about 46 hectares (115 acres) in extent and up to 30 metres deep. It has been studied by various naturalists, a bibliography being given by Lind (1944), who studied the net phytoplankton for the previous three years. Pearsall (1923) also worked on net samples taken by Tattersall and Coward in 1912 and 1913. Following the acquisition of the Mere by the Nature Conservancy in 1961 as a National Nature Reserve the present survey was started, as an attempt to follow the plankton in more detail and over a longer period of time.

Most of the work was necessarily carried out at a distance, and is therefore limited in scope. However, it has yielded interesting data, especially when viewed in the wider context of other studies being undertaken on this water-body by various workers, now loosely associated as the Meres Research Group. This article summarises the results obtained, and it is hoped they will serve as a basis for more detailed investigations, which are urgently needed. In particular, it may be possible to correlate the large blooms of blue-green algae with the great water-bird population (Nature Conservancy Report for 1961), although nothing more than an account of phytoplankton fluctuations can be given here.

Mere Mere is approximately one third the size of Rostherne, and according to Griffiths (1925) also attains a depth of 30 metres. It is partly surrounded by houses, and its outflow enters Rostherne Mere by way of the Rostherne Brook, about 1.5 kilometres in length.

METHODS

From May, 1962 to November, 1963 regular phytoplankton tows were taken from Rostherne, using a net of 180 mesh. These were monthly until February, 1963 and then fortnightly. From March, 1963 onwards 3-metre vertical tube samples (Lund and Talling, 1957) were taken by the staff of the Nature Conservancy, fixed with Lugol's iodine solution and forwarded by post to the Freshwater Biological Association. For the first year sampling was weekly, and then fortnightly, with monthly samples for the last part of 1966. Larger organisms were estimated by sedimentation counts and smaller ones by examination on a haemocytometer slide following concentration by means of sedimentation. From December, 1964 a 3-metre tube sample was taken from Mere Mere coinciding regularly with the Rostherne samples.

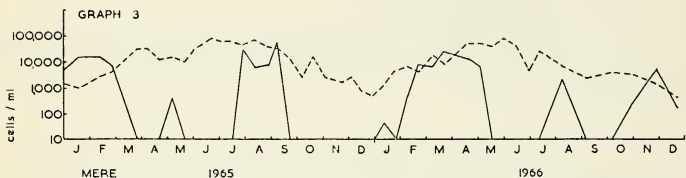
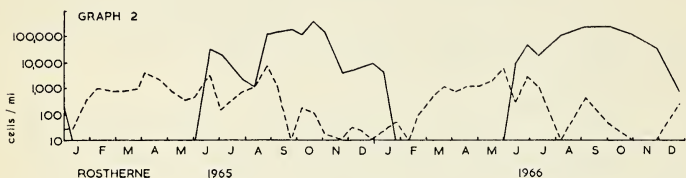
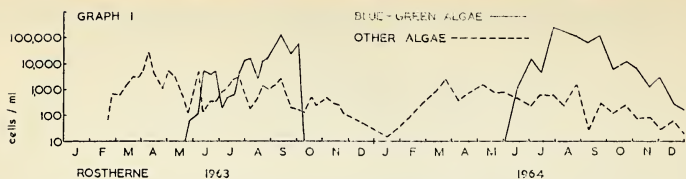
Also during 1963 the development of the thermocline was studied, from its formation in late May to its disappearance during November. In June and July it remained steady at between 5 and 10 metres depth, then gradually sank to 10–15 m. in September and 15–20 m. in October.

RESULTS

The net samples collected during 1962 and 1963 were useful for comparison with the net collections made in 1912–13 and 1941–3 and examined by Pearsall and Lind respectively, and indicate that the blue-green maxima have greatly increased in magnitude during the intervening years. However, the results of the sedimentation estimations made in 1963 demonstrated clearly the great tendency to concentration of the larger forms in the tow-net samples. The following account deals only with inverted microscope and haemocytometer counts.

The phytoplankton of Rostherne is best divided into two components, blue-green algae and those of all other groups. The latter component is present throughout the year, but is generally meagre. Its most constant member is *Rhodomonas minuta* var. *nannoplanktica*, though the peaks shown in Graphs 1 and 2 are usually due to other species, such as *Stephanodiscus tenuis* (April 1963, 24,000 cells per ml.) and *Asterionella formosa* (March, 1965, 5,700 cells per ml.).

Blue-green algae are completely absent from the phytoplankton during the spring, appearing suddenly at the end of May or beginning of June. There is usually a few weeks when *Anabaena flos-aquae* or *Aphanizomenon flos-aquae* is dominant, or there may be a mixture of both. Then *Microcystis aeruginosa* suddenly appears, the former



Graphs 1 and 2: Phytoplankton fluctuations in Rostherne Mere, 1963-6.

Graph 3: Phytoplankton fluctuations in Mere Mere, 1965-6.

species disappearing, and the water becomes green and turbid, like pea soup. The *Microcystis* blooms persist until the late autumn or winter, when they disappear as suddenly as they come. This can be seen on Graphs 1 and 2, where the first peak on each of the yearly blue-green bursts is due to *Anabaena* and *Aphanizomenon*, the later larger more extended peaks being *Microcystis*.

When the latter has reached a maximum and is starting to decline slightly in numbers a large concentration of cells of the bacterium *Sphaerotilus natans* appears in the plankton, up to 30,000 per ml. They occur in short filaments of three to four cells, though considerably longer threads are sometimes seen. The *Sphaerotilus* may disappear in a few weeks or it may persist for three months, as in 1964.

Mere Mere (Graph 3) has a much richer phytoplankton dominated during spring by the centric diatom *Stephanodiscus tenuis*, and at other times of the year, especially in summer, by members of the Chlorococcales, such as *Scenedesmus quadricauda* and *Coelastrum microporum*. Although *Microcystis* was recorded as a co-dominant by Griffiths (1925) it was not observed during the present study, and blue-green algae are now represented mainly by *Oscillatoria agardhii* var. *isothrix*, although *Aphanizomenon flos-aquae* appears occasionally and an unidentified straight species of *Anabaena* has been seen in one sample. The *Oscillatoria* occurs in short bursts at various times during the year, but does not dominate the plankton as do the *Microcystis* blooms of Rostherne.

As stated, the water of Mere Mere flows into Rostherne Mere by way of the Rostherne Brook. By comparison of the phytoplankton counts it was found that when certain species were abundant in Mere they could be found in small numbers in Rostherne, but never had any lasting effect on the plankton. During the months June to October, 1963 weekly phytoplankton net collections were taken from Rostherne Brook near its entry into Rostherne. Phytoplankton organisms were only present in appreciable numbers on three occasions, contrasting with the abundant phytoplankton at the outflow of Mere.

List of species present in counts
 (C = common, F = frequent, O = occasional, + = present, — = absent)

	Rostherne		Mere			Rostherne		Mere	
	M.		M.			M.		M.	
(a) Myxophyceae									
<i>Anabaena flos-aquae</i> (Lyngb.) Bréb.	C	—	—	—	<i>Asterococcus limneticus</i> G. M. Sm.	+	—	—	—
<i>Anabaena</i> sp.	—	+	+	+	<i>Botryococcus braunii</i> Kütz.	—	O	+	+
<i>Aphanizomenon flos-aquae</i> (L.) Ralfs	C	—	—	—	<i>B. protuberans</i> W. & G. S. West	—	O	—	—
<i>Coelosphaerium kützingerianum</i> Näg.	O	—	—	—	<i>Chlorella</i> sp.	—	—	F	O
<i>Gomphosphaeria</i> sp.	+	+	+	+	<i>Chodatella ciliata</i> (Lagerh.) Lemm.	—	—	O	O
<i>Mermisopedia glauca</i> (Ehrenb.) Näg.	+	—	—	—	<i>C. quadriseta</i> Lemm.	—	+	O	O
<i>Microcystis aeruginosa</i> Kütz.	C	—	—	—	<i>Coelastrum microporum</i> Näg.	O	—	C	C
<i>Oscillatoria agardhii</i> Gom. var. <i>isotrix</i> Skuja	O	—	—	—	<i>Crucigenia apiculata</i> Schindtle	—	—	C	C
<i>O. bornetii</i> Zukal.	+	—	—	—	<i>Dicymocystis inconspicua</i> Korshik.	—	—	F	O
(b) Chlorophyceae									
<i>Monomastix minuta</i> Skuja	O	+	+	+	<i>Elakatothrix lacustris</i> Korshik.	—	—	O	O
<i>Pedinomonas minor</i> Korshik.	+	—	—	—	<i>Lagerheimia geneensis</i> Chod.	—	—	—	—
<i>Scourfieldia complanata</i> G. S. West	+	—	—	—	<i>Nephrochlamys subsolitaria</i> (G. S. West)	—	—	—	—
<i>Chlamydomonas</i> spp.	F	—	—	—	Korshik.	—	—	—	—
<i>Eudorina elegans</i> Ehrenb.	O	—	—	—	<i>Oocystis</i> sp.	—	—	+	+
<i>Pandorina morum</i> (O. F. Müll.) Bory	O	—	—	—	<i>Pedastrium boryanum</i> (Turp.) Menegh.	—	—	O	O
<i>Pascheriella tetras</i> Korshik.	—	+	+	+	<i>P. duplex</i> Meyen	—	—	O	O
<i>Phacotus lenticularis</i> Stein	+	—	—	—	<i>P. tetras</i> (Ehrenb.) Ralfs	—	—	O	F
<i>Pteromonas aculeata</i> Lemm.	—	—	—	—	<i>Planctosphaeria</i> sp.	—	—	O	F
<i>P. angulosa</i> (Carter) Lemm.	—	—	—	—	<i>Raphidonomia longiseta</i> Vischer	—	—	O	O
<i>P. spinosa</i> Nygaard	—	—	—	—	<i>Scenedesmus acuminatus</i> (Lagerh.) Chod.	—	—	O	—
<i>Actinastrum hantzschii</i> Lagerh.	—	—	—	—	<i>S. bijuga</i> (Turp.) Lagerh.	—	—	—	—
<i>Ankistrodesmus acicularis</i> (A. Br.) Korshik.	—	—	—	—	<i>S. longus</i> Meyen	—	—	—	—
<i>A. falcatus</i> (Corda) Ralfs var. <i>spirilliformis</i>	—	—	—	—	<i>S. obliquus</i> (Turp.) Kütz.	—	—	—	—
G. S. West	—	—	—	—	<i>S. quadricauda</i> (Turp.) Bréb.	—	—	F	—
<i>A. fusiformis</i> Corda	O	+	F	+	<i>Scenedesmus</i> sp.	+	+	—	—
<i>A. subcapitatus</i> Korshik.	O	—	—	—	<i>Siderocelis nana</i> Fott & Heynig	+	+	—	—
<i>Ankya judayi</i> (G. M. Sm.) Fott	C	—	—	—	<i>S. ornata</i> Fott	+	+	O	F
					<i>Sphaerocystis schroeteri</i> Chod. <i>sensu lato</i>	+	+	O	F
					<i>Tetraëdron incus</i> (Teil.) G. M. Sm.	—	—	F	F

List of species present in counts

(C = common, F = frequent, O = occasional, + = present, — = absent)

	Rostherne M.	Mere M.		Rostherne M.	Mere M.
(a) Myxophyceae					
<i>Anabaena flos-aquae</i> (Lyngb.) Bréb.	C	—	<i>Asterococcus limneticus</i> G. M. Sm.	+	—
<i>Anabaena</i> sp.	—	+	<i>Botryococcus braunii</i> Kütz.	O	O
<i>Aphanizomenon flos-aquae</i> (L.) Ralfs	C	—	<i>B. protruberans</i> W. & G. S. West	—	+
<i>Coelosphaerium kützingianum</i> Näg.	O	—	<i>Chlorella</i> sp.	O	F
<i>Gomphosphaeria</i> sp.	+	+	<i>Chodatella ciliata</i> (Lagerh.) Lemm.	—	O
<i>Merismopedia glauca</i> (Ehrenb.) Näg.	+	—	<i>C. quadriseta</i> Lemm.	+	O
<i>Microcystis aeruginosa</i> Kütz.	C	—	<i>Coelastrum microporum</i> Näg.	O	C
<i>Oscillatoria agardhii</i> Gom. var. <i>isothrix</i> Skuja	O	C	<i>Crucigenia apiculata</i> Schmidle	—	C
<i>O. bornetii</i> Zukal.	+	—	<i>Dictyosphaerium pulchellum</i> Wood	O	F
			<i>Didymocystis inconspicua</i> Korshik.	O	O
			<i>Elakatothrix lacustris</i> Korshik.	O	O
			<i>Lagerheimia genevensis</i> Chod.	—	O
(b) Chlorophyceae					
<i>Monomastix minuta</i> Skuja	O	+	<i>Nephrochlamys subsolitaria</i> (G. S. West)		
<i>Pedinomonas minor</i> Korshik.	+	—	Korshik.	—	+
<i>Scourfieldia complanata</i> G. S. West	+	—	<i>Oocystis</i> sp.	—	F
<i>Chlamydomonas</i> spp.	F	C	<i>Pediastrum boryanum</i> (Turp.) Menegh.	O	F
<i>Eudorina elegans</i> Ehrenb.	O	—	<i>P. duplex</i> Meyen	O	O
<i>Pandorina morum</i> (O. F. Müll.) Bory	O	—	<i>P. tetras</i> (Ehrenb.) Ralfs	—	F
<i>Pascheriella tetras</i> Korshik.	—	+	<i>Planktosphaeria</i> sp.	—	O
<i>Phacotus lenticularis</i> Stein	+	—	<i>Raphidonema longiseta</i> Vischer	O	F
<i>Pteromonas aculeata</i> Lemm.	—	O	<i>Scenedesmus acuminatus</i> (Lagerh.) Chod.	O	C
<i>P. angulosa</i> (Carter) Lemm.	—	C	<i>S. bijuga</i> (Turp.) Lagerh.	—	+
<i>P. spinosa</i> Nygaard	—	+	<i>S. longus</i> Meyen	—	+
<i>Actinastrum hantzschii</i> Lagerh.	—	F	<i>S. obliquus</i> (Turp.) Kütz.	—	F
<i>Ankistrodesmus acicularis</i> (A. Br.) Korshik.	—	C	<i>S. quadricauda</i> (Turp.) Bréb.	F	C
<i>A. falcatus</i> (Corda) Ralfs var. <i>spirilliformis</i>			<i>Scenedesmus</i> sp.	+	—
G. S. West	O	F	<i>Siderocelis nana</i> Fott & Heynig	+	—
<i>A. fusiformis</i> Corda	+	—	<i>S. ornata</i> Fott	+	O
<i>A. subcapitatus</i> Korshik.	O	C	<i>Sphaerocystis schroeteri</i> Chod. <i>sensu lato</i>	F	F
<i>Ankyra judayi</i> (G. M. Sm.) Fott	C	—	<i>Tetraëdron incus</i> (Teil.) G. M. Sm.	—	F

	Rostherne M.	Mere M.		Rostherne M.	Mere M.
<i>T. minimum</i> (A.Br.) Hansg.	—	O	<i>Melosira granulata</i> (Ehrenb.) Ralfs	F	O
<i>Tetrastrum staurogeniaeforme</i> (Schröd.) Lemm.	O	F	<i>M. varians</i> C.Ag.	O	—
<i>Treubaria triappendiculata</i> Bern.	+	—	<i>Navicula cryptocephala</i> Kütz.	O	—
<i>Closterium acutum</i> Bréb. var. <i>variabile</i> (Lemm.)			<i>Nitzschia acicularis</i> W.Sm.	—	O
Krieger	O	O	<i>N. sigmoidea</i> (Ehrenb.) W.Sm.	+	—
<i>C. gracile</i> Bréb.	O	O	<i>Rhoicosphenia curvata</i> (Kütz.) Grun.	+	—
<i>Staurostrum paradoxum</i> Meyen <i>sensu lato</i>	O	—	<i>Stephanodiscus astraea</i> (Ehrenb.) Grun.	F	—
			<i>S. hantzschii</i> Grun.	C	C
(c) Xanthophyceae			<i>S. tenuis</i> Hust.	—	C
<i>Goniochloris fallax</i> Fott	—	F	<i>Synedra acus</i> Kütz.	+	—
<i>G. mutica</i> (A.Br.) Fott	—	F	<i>S. ulna</i> (Nitzsch) Ehrenb.	—	O
<i>Nephrodiella lunaris</i> Pascher	O	O			
<i>Trachydiscus lenticularis</i> Ettl	—	O	(f) Cryptophyceae		
			<i>Cryptomonas erosa</i> Ehrenb. <i>sensu lato</i>	C	C
(d) Chrysophyceae			<i>C. ovata</i> Ehrenb. <i>sensu lato</i>	C	C
<i>Chrysococcus rufescens</i> Klebs	C	C	<i>Rhodomonas minuta</i> Skuja var. <i>nannoplanktica</i>		
<i>Dinobryon</i> sp.	+	+	Skuja	C	C
<i>Mallomonas akrokomos</i> Ruttn.	C	C			
<i>Pseudokephyrion ellipsoideum</i> (Pascher) Conrad	C	—	(g) Dinophyceae		
<i>Pseudopedinella</i> sp.	—	O	<i>Ceratium hirundinella</i> O. F. Müll.	C	O
<i>Stenokalyx monilifera</i> Schmid	C	C	<i>Gymnodinium fuscum</i> (Ehrenb.) Stein	C	—
<i>Synura</i> sp.	O	O	<i>Peridinium</i> sp.	C	—
(e) Bacillariophyceae			(h) Euglenophyceae		
<i>Achnanthes minutissima</i> Kütz.	+	—	<i>Euglena viridis</i> Ehrenb.	—	+
<i>Asterionella formosa</i> Hassall	C	O	<i>Euglena</i> sp.	O	—
<i>Cocconeis placentula</i> Ehrenb.	+	—	<i>Phacus</i> sp.	+	+
<i>Cyclotella meneghiniana</i> Kütz.	O+	C	<i>Trachelomonas hispida</i> (Perty) Stein em. Defl.	—	+
<i>C. pseudostelligera</i> Hust.	+	O	<i>T. rugulosa</i> Stein	—	+
<i>Cymatopleura solea</i> (Bréb.) W.Sm.	+	—	<i>T. stokesiana</i> Palmer	+	—
<i>Diatoma vulgare</i> Bory	+	—	<i>T. volvocina</i> Ehrenb.	O	+
<i>Fragilaria capucina</i> Desmaz.	F	—			
<i>F. crotonensis</i> Kitton	F	—	Note: three green flagellates of uncertain systematic position,		
<i>Gomphonema constrictum</i> Ehrenb.	+	—	<i>Monomastix</i> , <i>Pedinomonas</i> and <i>Scourfieldia</i> , have here been included		
			in the Chlorophyceae, following tradition.		

	Rostherne M.	Mere M.		Rostherne M.	Mere M.
<i>T. minimum</i> (A.Br.) Hansg.	—	0	<i>Melosira granulata</i> (Ehrenb.) Ralfs	F	0
<i>Tetrastrum staurogamaforme</i> (Schröd.) Lemm.	0	F	<i>M. varians</i> C.Ag.	0	—
<i>Trebaria triappendiculata</i> Bern.	+	—	<i>Naevicula cryptocephala</i> Kütz.	0	0
<i>Closterium acutum</i> Bréb. var. <i>variabile</i> (Lemm.) Krieger	0	0	<i>Nitzschia acicularis</i> W.Sm.	—	—
<i>C. gracile</i> Bréb.	0	0	<i>N. sigmoidea</i> (Ehrenb.) W.Sm.	+	+
<i>Staurostrum paradoxum</i> Meyen sensu lato	0	—	<i>Rhoicosphenia curvata</i> (Kütz.) Grun.	F	—
(c) Xanthophyceae			<i>Stephanodiscus astraea</i> (Ehrenb.) Grun.	C	0
<i>Goniochloris fallax</i> Fott	—	F	<i>S. hantzschii</i> Grun.	—	0
<i>G. mutica</i> (A.Br.) Fott	—	F	<i>S. tenuis</i> Hust.	+	—
<i>Nephrوديella lunaris</i> Pascher	0	0	<i>Synedra acuta</i> Kütz.	—	—
<i>Trachydiscus lenticularis</i> Ettl	—	0	<i>S. ulna</i> (Nitzsch) Ehrenb.	—	—
(d) Chrysoephyceae			(f) Cryptophyceae		
<i>Chrysococcus rufescens</i> Klebs	C	C	<i>Cryptomonas erosa</i> Ehrenb. sensu lato	C	C
<i>Dinobryon</i> sp.	+	+	<i>C. ovata</i> Ehrenb. sensu lato	C	C
<i>Mallomonas akrokomos</i> Ruttn.	C	—	<i>Rhodomonas minuta</i> Skuja var. <i>namoplanktica</i> Skuja	C	C
<i>Pseudoekephyrion ellipsoideum</i> (Pascher) Conrad	C	0	(g) Dinophyceae		
<i>Pseudopedinella</i> sp.	—	0	<i>Geratium hirundinella</i> O. F. Müll.	C	0
<i>Stenokalyx monilifera</i> Schmid	C	0	<i>Gymnodinium fuscum</i> (Ehrenb.) Stein	C	—
<i>Symura</i> sp.	0	0	<i>Peridinium</i> sp.	C	—
(e) Bacillariophyceae			(h) Euglenophyceae		
<i>Achnanthes minutissima</i> Kütz.	+	—	<i>Euglena viridis</i> Ehrenb.	—	+
<i>Asterionella formosa</i> Hassall	C	0	<i>Euglena</i> sp.	0	+
<i>Coconeis placentula</i> Ehrenb.	+	—	<i>Phacus</i> sp.	+	+
<i>Cyclotella meneghiniana</i> Kütz.	0	0	<i>Trachelomonas hispida</i> (Perty) Stein em. Defl.	—	+
<i>C. pseudostelligera</i> Hust.	+	0	<i>T. rugulosa</i> Stein	—	—
<i>Cymatopleura solea</i> (Bréb.) W.Sm.	+	—	<i>T. stokesiana</i> Palmer	+	—
<i>Diatoma vulgare</i> Bory	+	—	<i>T. volvocina</i> Ehrenb.	0	+
<i>Fragilaria capucina</i> Desmaz.	F	—			
<i>F. crotonensis</i> Kitton	F	—			
<i>Gomphonema constrictum</i> Ehrenb.	+	—			

Note: three green flagellates of uncertain systematic position, *Monomastix*, *Pedinomonas* and *Scourfieldia*, have here been included in the Chlorophyceae, following tradition.

ACKNOWLEDGEMENTS

We are very grateful to the Nature Conservancy's staff at Rostherne, Cheshire, and Attingham Park, Shropshire, who collected all samples in the later stages of the work and also gave help in numerous other ways.

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ENTOMOLOGICAL SECTION AT EDLINGTON WOOD

18th June, 1966

J. H. FLINT AND C. I. RUTHERFORD

The current effort of the Section on the revision of the county list of Lepidoptera has led to much re-reading of the old records, Porritt's List in particular. All those concerned have been struck by the large number of references made to Edlington Wood, near Doncaster, and to a slightly lesser degree to Wadworth Wood. There has been no corresponding mention of these woods in recent reports and the Entomological Survey Committee recommended that they be revisited to see if they could still be regarded as a really fruitful collecting ground.

Permits were readily obtained from Messrs. Jackson-Stops and Staff, the managing agents for Edlington Wood, and from the Forestry Commission for Wadworth Wood. Both were most helpful to us and showed great interest in our proposal, but warned us that the construction of the new motorway M18 on the one hand and of a large housing estate on the other might well have disturbed the wild life of the woods by comparison with earlier years. The systematic clearing and natural regeneration of the woods also has its effect on wild life, but on balance this is probably an advantage in that large open areas with plenty of low plants and shrubs tend to encourage insect life.

In the event the weather was good and about ten members spent the greater part of the day in the woods, mainly but by no means entirely in Edlington Wood where we made our base at the Woodhouse. Unfortunately no members were able to stay on after dark to work with M.V. light so that a representative list of night-flying moths was not obtained; from what we were able to record we believe that such an operation would be well worth while.

The following species were recorded:

Lepidoptera

- Pieris brassicae* L. (Large White)
P. rapae L. (Small White)
P. napi L. (Green-veined White)
Euchloe cardamines L. (Orange Tip)
Vanessa cardui L. (Painted Lady)
Ochlodes venata B. & G. (Large Skipper)
Achlya flavicornis L. (Yellow Horned) as larva
Drepana falcatoria L. (Pebble Hook-tip)
Plusia gamma L. (Silver Y)
Dysstroma truncata Hufn. (Common Marbled Carpet)

Xanthorhoe montanata Borkh. (Silver Ground Carpet)
Hydrelia flammeolaria Hufn. (Small Yellow Wave)
Earophila badiata Hubn. (Shoulder Stripe) as larvae
Eupithecia castigata Hubn. (Grey Pug)
Abraxas sylvata Scop. (Clouded Magpie)
Lomaspilis marginata L. (Clouded Border)
Cabera pusaria L. (Common White Wave)
Plagodis dolabraria L. (Scorched Wing)
Cleora repandata L. (Mottled Beauty) as larva
Eurrhypara hortulata L. (Small Magpie)
Hapalia olivalis Schiff. (Olive Brindled Pearl)

Hymenoptera

<i>Calameuta pallipes</i> Klug	<i>Tenthredopsis nassata</i> L.
<i>Athalia cordata</i> Lep.	<i>Tenthredo mesomelas</i> L.
<i>A. lineolata</i> Lep.	<i>T. livida</i> L.

Hemiptera Heteroptera

Macrotylus solitarius Mey.

Hemiptera Homoptera

<i>Speudotettix subfuscus</i> Fall.	<i>Cixius nervosus</i> L.
<i>Thamnotettix confinis</i> Zett.	<i>Cercopis vulnerata</i> Ill.

Diptera

<i>Syrphus balteatus</i> Deg.	<i>Xylota sylvarum</i> L.
<i>Eristalis nemorum</i> L.	

Coleoptera

Orsodacne cerasi L.

In the main, members' attention was devoted to the Lepidoptera and most of the other insects noted above were netted whilst watching for moths to 'break cover'. The plant life of the woods was naturally of interest but as no botanist was present no list was prepared. We were struck by the considerable number of fair-sized Small-leaved Lime trees (*Tilia cordata*), an uncommon tree which has recently been brought to the attention of all lepidopterists because of its association with the Scarce Hook-tip (*Drepana harpagula*) in the Wye valley. Two rather local herbaceous plants were noted; the Spurge-laurel (*Daphne laureola*) and the Wild Columbine (*Aquilegia vulgaris*).

It will be seen that no Lepidoptera of great significance were recorded. The date had been chosen in the hope of finding two uncommon geometers recorded in the past. In spite of the abundance of Dogwood (*Thelycrania sanguinea*) there was no sign of the Little Thorn (*Cepphis advenaria*) which is not difficult to disturb in day-light. The Waved Carpet (*Hydrelia testaceata*) was said in Porritt's List to be abundant at rest on Alder trunks; we were not able to find a good stand of mature Alder so were not able to look for this moth.

We concluded that these woods still provide a good and varied habitat, and that if worked regularly, principally at night for moths, they could be expected to yield a number of worthwhile records.

Stomach contents of Dogfish

In the course of dissection of a male dogfish (*Scyliorhinus caniculus*) a skeleton of the thecate hydroid (*Dynamena pumila*) complete with its basal growth was found in the pyloric limb of the stomach. The cardiac limb contained the remains of crab, herring and the customary large number of worms.

ELLEN HAZELWOOD — Canon Slade Grammar School

A review of the PROTECTION OF BIRDS ACTS, 1954 TO 1967

CHARLES H. WILSON

Hon. Sec. Protection of Birds Act Committee, Yorkshire Naturalists' Union

The lack of knowledge of the Protection of Birds Acts, due very largely to their complexity and the legal phrasing of the various clauses, makes it difficult for persons interested in the protection of our wild birds to take an active part in protecting them. The following summary of some of the provisions of the Acts and their related Statutory Instruments, which is not intended to cover all aspects of them, or be fully comprehensive, may be of some help.

1. The Protection of Birds Act, 1967 was introduced on the 14th July, 1967 and comes into force on the 14th January, 1968.

The 1967 Act amends parts of the 1954 Act and adds new provisions and with the (amendment) Act, 1964, they can all be referred to officially as the Protection of Birds Acts, 1954 to 1967.

In reviewing this recent Act, it seems sensible to include also the amendments made to the 1954 Act by the various Statutory Instruments made from time to time, but in order to keep within reasonable bounds and to avoid innumerable complications, to restrict these to the ones which affect us in Yorkshire.

2. **ALL WILD BIRDS, THEIR NESTS AND EGGS ARE PROTECTED BY THE ACT AT ALL TIMES.** This applies to all species, whether mentioned or not in the schedules to the 1954 Act, those in the first schedule being protected under special penalties, with the following general exceptions:

- (a) **AN AUTHORISED PERSON**, usually defined as the land owner or some person having his authority, on his own land can kill or take at any time, any bird mentioned in the Second Schedule to the 1954 Act. This includes Cormorant, Shag, common predatory Gulls, the Crow family, Pigeons, House Sparrows and Starling.

AN AUTHORISED PERSON can also take the eggs of Wild Ducks, Geese or Swans for the purpose of hatching them.

- (b) Any person may take for any purpose the eggs of a bird in the Second Schedule, or the eggs of the Black Headed Gull or Common Gull for food for either human consumption or as food for ornamental wildfowl or poultry. He may also take the eggs of a Lapwing before the 15th April in any year for his own consumption, but it is now illegal to sell, offer for sale, barter or exchange or import Lapwing eggs and therefore it is illegal for Hotels and Restaurants to offer Lapwing eggs on their bills of fare.

- (c) Subject to the following conditions and outside the Close Season, shooting is permitted of birds listed in the Third Schedule of the 1954 Act, which includes the game birds, wild ducks and geese with certain exceptions, Coot, Moorhen, etc. (but the Brambling and Black Tailed Godwit listed with them are now fully protected at all times).

- (i) It is illegal to shoot these birds in Sanctuaries and Reserves for example Spurn, Fairburn or the Humber Sanctuary or to enter the Humber Sanctuary between the 1st Sept. and the 20th Feb.

- (ii) It is illegal to shoot these birds on Sundays in the North and West Ridings of Yorkshire and the County Boroughs of Doncaster and Leeds.

- (iii) It is illegal to sell, offer for sale, or have in ones possession for sale, barter or exchange, unless specifically licensed, any dead wild goose of any species at any time, or any other bird listed in the Third Schedule between the 28th February and the 31st August in any year.

It should also be noted that although the Protection of Birds Acts, 1954 to 1967 permit these birds to be shot subject to the conditions outlined above, offences against other Laws can still make shooting them illegal, for example:

- (iv) Shooting on land without the permission of the owner.
- (v) Shooting within the prescribed distance of public footpaths and roads.
- (vi) Shooting within Public Parks or Recreation Grounds subject to local Byelaws.
- (vii) Shooting certain game birds without being in possession of a game licence.
- (viii) Possessing or using a shot gun (from 1st May, 1968) or rifle without a Police Certificate.

For information the Close Season referred to above, in which these birds are fully protected is:

Capercaile, Pheasant, Woodcock	}	1st Feb. to 30th Sept.
Partridge, Coot, Moorhen		
Golden and Grey Plover		1st Feb. to 31st Aug.
Redshank, Curlew		
Snipe		1st Feb. to 11th Aug.
Grouse		11th Dec. to 11th Aug.
Wild Ducks and Geese.	}	
Below the high water mark of ordinary spring tides		21st Feb. to 31st Aug.
in all other areas		1st Feb. to 31st Aug.

3. An entirely new section has been added to the Act, in that it is now an offence to wilfully disturb any bird in the First Schedule, that is the rarer species and may include any birds in Sanctuaries or Reserves, at or near their nests containing eggs or young, unless official approval has first been obtained from the National Environment Research Council, but the disturbance by authorised persons of birds in the Second Schedule in Sanctuaries and Reserves is not an offence.
Disturbance includes photography and the inspection of the nest, but does not restrict photography or nest inspection outside sanctuaries of birds not included in the First Schedule.
4. Another revised section of the Act refers to ringing or marking birds and makes illegal the use of nets, mist nets or any other devices for taking birds in flight or rocket or cannon nets for birds on the ground, unless they are operated by licensed or authorised persons. Application for ringing licences should be made to The National Environment Research Council.
5. The use of Gas, poisoned, poisonous or stupefying substances to take or kill wild birds as well as Bird Lime, Gins, Traps and Electrical Devices to frighten them are prohibited unless a special licence has first been obtained from the Secretary of State, the National Environment Research Council or the Ministry of Agriculture and Fisheries.
6. The Secretary of State may declare an extension of the Close Season for any species named in the Third Schedule, if severe weather conditions persist, to give these birds special protection.
7. It is illegal to catch and keep; or to sell any species listed in the Fourth Schedule of the Act, unless these birds have been bred in captivity and close ringed when young. This schedule includes all those birds which are good songsters or have attractive plumage. The only exception to this being that in certain circumstances a licence may be issued by The Secretary of State enabling certain species to be taken for aviculture.
8. It is illegal, with certain special exceptions and unless specifically licensed, to sell, or offer for sale any live wild bird, any egg of a wild bird, including blown eggs, or the skin or plumage of any wild bird recently taken.
9. It is not an offence under the Protection of Birds Act, 1954 to 1967 if a person kills or attempts to kill any wild bird other than those listed in the First Schedule, which are fully protected at all times under special penalties, if he can satisfy a Court of Law that:
 - (a) By so doing he has prevented serious damage to crops, vegetables, fruit, growing timber or to fisheries.

- (b) The bird being so seriously injured that he killed for humane reasons, or that he took the bird being injured with a view to bringing it back to health and then releasing it.
 - (c) A licence has been obtained from The Secretary of State to take or kill within a specified area a bird in the First Schedule to prevent damage as in (a) above.
 - (d) That the act of killing, or disturbing a bird in the first schedule in a Sanctuary, was an incidental result of a lawful operation and could not reasonably be avoided.
10. Additional powers have been given to Police Constables under the 1967 Act whereby they may search without warrant any person or property, if it is suspected that this search will reveal an offence against birds listed in the First Schedule, that is the rarer species. The following birds have been added to the original list; Barn Owl, Red Backed Shrike and Sparrow Hawk, but the Collared Dove has been removed although it still has full protection.
 11. A specific section of the 1967 Act states that the Council of any County or County Borough may take such steps as they think expedient for bringing the effect of these Acts to the attention of the public and I strongly recommend that individuals of the Yorkshire Naturalists' Union press their local Councils to do just this to give publicity to these Acts and to see they are observed by the general public.
 12. The wording of these Protection of Birds Acts, 1954 to 1967 and the Statutory Instruments seem to be unnecessarily complicated and in the preceeding paragraphs I have attempted to make them readily understood even if in some instances the full details and implications have not been quoted.

The implementation of the various sections of the Acts should be undertaken by all nature lovers and any breaches observed reported with relevant facts, names of persons concerned, witnesses, date and time of day, etc., to the local Police Office and also to the Honorary Secretary of the Protection of Birds Act Committee of the Yorkshire Naturalists' Union either by letter or telephone at the address given below so that appropriate action and if possible prosecution of offenders can be undertaken. It is essential to ensure that the Act is fully enforced and understood by the general public and maximum publicity given to prosecutions so that our wild birds are given the full protection they deserve. It is strongly recommended that all persons interested in protection should obtain copies of the Acts, details of which are given below.

REFERENCES:	Protection of Birds Act 1954.	Price 1/-
	" " " " 1954 (amendment) Act 1964.	Price 3d.
	" " " " 1967.	Price 1/-
	Statutory Instruments 1955. No. 1286.	Price 2d.
	1955. No. 1532.	Price 2d.
	1957. No. 318.	Price 3d.
	1961. No. 470.	Price 2d.
	1962. No. 2592.	Price 3d.
	1966. No. 1575.	Price 5d.
	Firearms Act 1937	Price 2/6
	" " 1965	Price 1/6
	Air Guns and Shotguns Act 1962	Price 5d.
	Criminal Justice Act 1967 Part V (Shot Gun Certificates required from 1st May, 1968, obtainable from Police).	

All the above obtainable from H.M. Stationery Office, Kingsway, London W.C.2 and National Environment Research Council, 19 Belgrave Square, London S.W.1. Extra for postage should be included with order.

The R.S.P.B., The Lodge, Sandy, Bedfordshire intends to publish a simplified version of the provisions of the Acts early in 1968 called *Wild Birds and the Law*.

AUTUMN BRYOLOGICAL EXCURSION

MARY DALBY

A joint meeting with the British Bryological Society was held from 2nd-9th September, 1967, based on Northallerton to work the Cleveland Hills and to record some of the grid squares for the mapping scheme.

On Sunday a visit was paid to Gormire where *Ricciocarpus natans* was abundant in both lakes and *Dicranum strictum** and *Mnium rugicum** were the first records for vice-county 62. Climbing up through Garbutt Wood to the scars of Whitstonecliff *Gyroweissia tenuis* and *Seligeria recurvata* were noted fruiting abundantly. Sutton Bank was rich in calcicoles and a forest ride below Roulston Scar produced *Plagiothecium curvifolium** on hawthorn and *Scapania aspera** on scree. *Mielichhoferia elongata*, in its only known English station, was the object of Monday's excursion to Ingleby Greenhow and members were rewarded by finding both this and, growing with it, *Coscinodon cribrosus**, a new County record. *Dicranella subulata**, *Riccardia palmata**, *Discelium nudum* and *Solenostoma sphaerocarpum* were also noted.

On Tuesday Pilmoor, almost the last area of lowland heath remaining in the Vale of York, was visited. Here *Dicranum spurium**, *D. polysetum**, *Odontoschisma denudatum**, *O. sphagni* and *Acrocladium cordifolium* were noted, but the best find of the week was from the disused railway line where Mrs. J. A. Paton found *Fossombronina incurva** new to England. Unfortunately the weather deteriorated in the afternoon and Leckby Carr (V.C. 65) presented an impenetrable jungle of overgrown carr which daunted most members. However, *Riccardia sinuata** from a nearby ditch was a new record.

On Wednesday the party divided, one group going to Arncliffe Woods in Eskdale where a number of old records were confirmed, *Harpanthus scutatus**, *Hygrobiella laxifolia** and *Plectocolea paroica** being the most notable. Also here were *Lejeunea cavifolia**, *Calypogeia neesiana* var *meylanii**, *Radula complanata*, *Plectocolea obovata* and *Scapania umbrosa*. Another group went to Kepwick Hall grounds and the moorland behind where a variety of habitats of old quarries, basic flushes and acid moorland provided an enjoyable day. Ashberry Hill near Rievaulx and the marshy meadows nearby were interesting for a variety of calcicoles when members visited them on Thursday and *Isopterygium seligeri** found in Tup Hag Wood was confirmation of an old record for the vice-county.

The last day was spent in the Osmotherley area, first visiting the Thimbleby Park woods leading up to Oakdale reservoir where a number of interesting species were found both in the woodland and on the old stonework of the reservoir outlet, among them *Priessia quadrata*, *Trichocolea tomentella*, *Scapania irrigua* and *Bryum bornholmense**. In the afternoon Scarth Bog, a National Trust property about two miles north of Osmotherley, produced several species of *Sphagna*, *Splachnum ampullaceum*, *Mylia anomala* and *Cephalozia connivens*. Scugdale and Mount Grace Priory were visited by parties on the return journey.

During the week various groups examined stubble fields and waste ground, *Bryum ruderale**, *B. violaceum**, *B. klinggraeffii* and *B. rubens* were noted for V.C. 62; *Anthoceros punctatus** and *Physcomitrella patens** for V.C. 65. *Pellia neesiana** and *Scapania scandica** were also recorded from Spaunton Moor.

A short article permits little more than the new vice-county records when reporting on a week's work, but an impressive number of both common and rare species were found which are of value both to the grid square mapping scheme and to the Y.N.U. records of distribution within the county.

Birds and Wild Africa by William Condry. Pp. 192 with 16 pages of illustrations. 1967. Collins. 30/-.

From a base in the sparsely populated northern end of Zambia, the author visited the little known and very wild region that extends down the Western Rift Valley from Lake Tanganyika to the Poroto Mountains north of Lake Nyasa. A great deal has been written about the game animals of East Africa but this book deals with the birds, insects, wild plants and trees in the region where East and Central Africa meet. Mr. Condry has trained his observant eye upon a wilderness which is still very rich in wild life, especially birds. It does not claim to be anything more than a readable book, and in this it succeeds admirably, while the photographs by the author add to the interest and enjoyment of the reader.

D.F.W.

AUTUMN FUNGUS FORAY AT RICHMOND

T. F. HERING

About fifteen members attended this Foray which was held from 14th-17th September, 1967, using a workroom kindly provided by St. Francis Xavier's School. Conditions were generally a bit dry and the woodlands at Easby, Aske and Clapgate Gill produced little of note. Grassland was relatively speaking more rewarding. Billy Banks, just outside the town beside the river Swale, was the most fruitful site, with large collections of *Craterellus cornucopioides* and two handsome *Ramarias*, one of them *R. botrytis* and the other a large buff-coloured species which was collected in the same place on the 1956 Foray and remained unnamed. Specimens of this were submitted to Mr. D. A. Reid and provisionally identified as *R. obtusissima* but a firm determination must await further collections and observations. Several members were active with their cameras, and a return visit was made here before the party left. Identifications in the workroom were made harder by the unavoidable absence of some regular attenders. Mr. W. G. Bramley, who has contributed so many of these reports, was unable to attend for the first time in many years.

Y.N.U. AUTUMN FORAY, RICHMOND 1967 — PROVISIONAL FORAY LIST

(A1 = Aske, Black Plantation; A2 = Aske Park; B = Billy Banks;

C = Clapgate Gill; E = Easby)

PHYCOMYCETES

Syzygites sp. on *Amanita rubescens*, A2

ASCOMYCETES

Helvella crispa, B*Leotia lubrica*, B*Nectria cinnabarina*, E*Rhytisma acerinum*, B C*Stigmatella robertiana*, C*Geoglossum viride*, B*Oridea* sp., B*Xylaria polymorpha*, E*Xylaria hypoxylon*, B*Humaria hemisphaerica*, B*Hypoxylon coccineum*, A2*Pyronema* sp. on burnt wood, B

GASTEROMYCETES

Bovista plumbea, C*Lycoperdon pyriforme*, B A2*Phallus impudicus*, B*Crucibulum vulgare*, E*Scleroderma aurantium*, B E

HYMENOMYCETES (other than agarics)

Calocera viscosa, A1 B*C. cornea*, B*Clavaria cinerea*, B*Ramaria botrytis*, B*R. sp. cf. obtusissima*, B (det. D. A. Reid)*Hydnum repandum*, A2 B*H. rufescens*, B*Polystictus versicolor*, A1*Fomes annosus*, A1 B*Thelephora terrestris*, A1*Stereum hirsutum*, A1; *sanguinolentum*, A1

AGARICS

Amanita fulva, A2; *pantherina*, B; *rubescens*, A2, B; *?excelsa*, A1*Armillaria mellea*, A2 C*Asterophora lycoperdoides*, on *Russula nigricans*, B*Bolbitius vitellinus*, C*Boletus badius*, A2; *chrysenteron*, B; *elegans*, C*Collybia cirrhata*, B; *confluens*, A2 B; *maculata*, A1; *peronata*, B*Cantharellus cibarius*, B; *tubaeformis*, A2 B*Clitopilus prunulus*, B*Coprinus atramentarius*, C; *plicatilis*, B C*Craterellus cornucopioides*, B; *sinuosus*, B*Galerina hypnorum*, A1; *mutabilis*, B*Gymnopilus junonius*, A2*Hygrophorus chlorophanus*, C; *coccineus*, C; *eburneus*, B E; *psittacinus*, C; *uliginosus*, C;*virginus*, C

Hygrophoropsis aurantiacus, A2
Hypholoma fasciculare, A1 A2 B; *marginata*, A1
Inocybe asterospora, B E; *cookei*, B; *bongardii*, B
Laccaria amethystea, B; *laccata*, B; *proxima*, A1
Lactarius blennius, A2 B; *chrysorrheus*, E; *glyciosmus*, A1; *mitissimus*, B; *pallidus*, E;
piperatus, B; *pterosporus*, B (det. D. A. Reid); *quietus*, B; *rufus*, A1; *subdulcis*,
A2 B; *tabidus*, A1; *turpis*, A1
Macrocystidia cucumis, B
Marasmius androsaceus, A1; *rotula*, B
Mycena galericulata, A1 A2 B; *galopus*, A1 B; *speirea*, A1 B; *fibula*, B
Nolanea cetrata, A1; *stauropora*, C E
Oudemansiella radicata, A2 B
Paxillus involutus, A1 B E
Panaeolus sphinctrinus, C
Pholiota squarrosa, C
Pluteus cervinus, A2
Russula aeruginosa, A2; *atropurpurea*, A2 B; *cyanoxantha*, A2 B; *emetica*, A2 B; *fellea*,
A2 B; *foetens*, B; *lauro-cerasi*, B; *mairi*, A2 B; *nigricans*, A2 B; *ochroleuca*, A1 B
Stropharia aeruginosa, A2; *semiglobata*, C
Tricholoma argyraceum, B; *sciodes*, B
Tricholomopsis rutilans, A1

UREDINALES

Coleosporium tussilaginis on *Arctium*
Melampsora sp. (*capreae*?) on *Salix*, E
Puccinia punctata on *Cirsium arvense*, C; *striiformis* on *Holcus*, A2; *striiformis* on
Agropyron caninum, B
Trachyspora intrusa on *Alchemilla*, A2

BOOK REVIEWS

Wayside and Woodland Fungi by W. P. K. Findlay. Pp. xi + 202, with 59 colour illustrations of fungi by Beatrix Potter, 28 by R. B. Davis, and 20 by E. C. Large, also 19 black and white photographs and 8 line drawings. Frederick Warne. 1967. 65/-.

This is a clearly written handbook to the common macro-fungi found in Britain. Apart from the main body of the book, which consists of plainly-worded descriptions of the various groups, and of some 350 individual species, there is a section on ecology, as well as valuable advice on how to collect fungi, and how to proceed about their identification. The nomenclature is modern, following for the most part the B.M.S. 1960 Check-List. Wherever appropriate, the existence of a specialist monograph is mentioned. Curiously, alone of the now celebrated series published in *The Naturalist*, that by Pearson on *Lactarius* is omitted.

There are simple keys to the different major groups of *Hymenomycetes*, and to the commoner species of eight particularly important genera, namely *Tricholoma*, *Clitocybe*, *Mycena*, *Russula*, *Lactarius*, *Boletus*, *Clavaria* and *Stereum*. This is an excellent idea, but the author has reduced the usefulness of his keys by being rather too frugal in his selection of species. Thus, with regard to the *Lactarius* key, neither *L. quietus*, *mitissimus*, nor *tabidus* is considered common enough to demand inclusion. Another example is *Clavaria*, where naturalists using the key in this county will soon get into serious difficulty because of the omission of *C. luteo-alba* and *C. acuta*. Here and elsewhere, it must be regretted that not even brief notes are appended of the various species which the author can only narrowly have decided not to require full treatment. These omissions clearly increase the likelihood of the user of the book arriving at the wrong answer.

The coloured illustrations represent only some hundred species, which is not nearly enough, but are nevertheless of special interest. Those by Beatrix Potter are very beautiful, some sublimely so (e.g. *Oudemansiella radicata*, *Hygrophorus niveus*), and convey the texture of the subjects marvellously well, although one suspects that a few (e.g. *Boletus piperatus*), have suffered from the loss of subtle nuances of colouring in the course of reproduction. Equally fine, though of quite different style, are those

by R. B. Davis. Those by E. C. Large are different again, and of their kind entirely acceptable, but it was surely a mistake to place some of these paintings on pages facing Beatrix Potter illustrations, for the two styles are not compatible. The delicacy of the Potter paintings makes the stronger line of those produced by Large seem coarse and clumsy (cf. Plates 22 and 23).

The publication of a popular general work on the identification of fungi is a rare event in this country. Indeed, had this book been published a few years ago, as recently as 1962, it would have had the field to itself, for Wakefield and Dennis's *Common British Fungi*, a work of quite comparable character, has been out of print for many years and is now only rarely obtainable and commands an astonishingly high price. However, in 1963 the Collins *Guide to Mushrooms and Toadstools*, by Morten Lange and Hora, was published, and in this instance comparisons are not so much odious as necessary and significant. Both this work and the one under review are books of notable quality by authors of distinction, Dr. Hora being one of our most expert agaricologists, and Dr. Findlay a mycologist of great experience. Lange and Hora is constructed around coloured illustrations of some 580 species, taken for the most part from Jakob Lange's magnificent *Flora Agaricina Danica*, with accompanying condensed descriptions. Findlay provides an expansive text, with relatively discursive descriptions of some 350 species, accompanied by coloured figures of only some 100 species. Thus in character the two books are very different, so different as to be complementary to each other. But most beginners want to acquire only one work in the first instance, and there is an important difference in price. There is no doubt in my mind that Findlay (65/-) is not twice as good a book as Lange and Hora (30/-). Nevertheless, enthusiasts for the macro-fungi who already possess Lange and Hora will find this new entry a costly but useful acquisition, providing as it does a quite different and complementary approach. And there are the Beatrix Potter paintings.

J.D.L.

Great Waters by Sir Alister Hardy. Pp. 542 with numerous plates and figures. Collins. 1967. 63/-.

Sir Alister Hardy's two volumes in the *New Naturalist* series, *The Open Seas*, were justifiably successful not only in popularising marine science but also in bringing together for students and other biologists the many facets of this complex subject. This lengthy book inevitably touches on some of the subject matter of *The Open Seas* but is primarily a personal account of the voyages of the research vessel *Discovery* in 1925-7 with special reference to the whales and plankton of Antarctic waters. The author's personal diary provides the narrative theme around which is woven an immense amount of information relating to the history and methods of the whaling industry, the methods of oceanographic research, and the complex interrelationship between the physical environment and the biology of the whales and the planktonic animals on which they feed. The findings of later surveys are also included and related to the earlier results and ideas, and the author must be congratulated on presenting in such readable form, so much of the information that is otherwise available only in the 33 large and technical volumes of *Discovery Reports*.

No reader will fail to be impressed by the tragic contrast between the immense physical and mental effort expended by the scientists and crews of the research vessels in trying to arrive at an understanding of the biology of whales and the equally hard and ingenious efforts devoted to achieving what in effect is the near-extirpation of these animals. Only now when commercial catches are declining rapidly does it appear that attention will be paid to the scientific view that internationally controlled whaling could both preserve these animals and still provide a worthwhile yield.

In such a beautifully illustrated book so full of unexpected information about many aspects of Antarctica one regrets finding occasional whimsical passages that must surely offend both scientific and lay readers. More serious is the fact that the personal diary extracts tend to be too numerous and repetitive and make the book too long. Although those relating to the scientific programme have value in illustrating the tedium and lack of glamour in such research, the lists of animals taken on the outward voyage and having little or no relevance to the main theme of the book could profitably have been omitted as could lengthy extracts dealing with, for example, the vegetation of oceanic islands or the ceremony of crossing the equator. In spite of these reservations, however, one cannot do other than recommend such an interesting book.

J.R.L.

The New Zealand Sea Shore by John Morton and Michael Miller. Pp. 638, with 32 plates and 220 figures. Collins. 1968. 84/-.

Few of us who knew this book was being written could have anticipated it would prove to be such a comprehensive and magnificently produced volume. The number, clarity and quality of the line drawings, and of the black and white and colour plates are such that it is a pleasure to handle and own this book, and the publishers are to be congratulated on the selling price which must be regarded as low in relation to the probably limited sales this volume will have outside Australasia and scientific libraries.

By selecting the major types of marine habitats on rock and soft bottoms and describing the plants and animals therein, before dealing with the distribution of the various combinations of species that occur together in particular regions of New Zealand, the authors have achieved an unusual combination of functional morphology and conventional littoral ecology, with many of the illustrations serving for identification purposes. Much of the detail can have little relevance for European readers other than to emphasise the comparative poverty of our own littoral fauna, to illustrate that the same general principles control distribution and zonation in New Zealand as here, and to make us aware of how much has been achieved so quickly by comparatively few New Zealand biologists.

J.R.L.

Sharks, Skates and Rays. Edited by Perry W. Gilbert, Robert F. Mathewson and David P. Rall. Pp. 624 with 256 figures and numerous tables in the text. Johns Hopkins Press; London, Oxford University Press. 1968. £7 2s. 6d. net.

If this book were to be ordered purely by title the purchaser might expect to receive a general treatise on these fish so it must be emphasised that this is actually a Symposium, with the advantages and limitations inherent in such publications; and it might be at least a kindness on the part of the editors of similar works to indicate their nature more clearly. As is normal in symposia the coverage of the subject can only be determined by a perusal of the titles of the articles, and the articles themselves vary greatly in scope, length and quality; but this is to describe the book under review and certainly not to denigrate it, since it contains much of the greatest interest to all professional workers on elasmobranchs. There is an excellent, succinct account of the evolution of the elasmobranchs by Bobb Schaeffer, who points out also how this ostensibly primitive group has more than kept pace so that the modern forms appear to be the most successful of their kind; a very different but stimulating discussion of electric organs is given by Grundfest; and Chieffi gives a very useful account of the reproductive system. There is no article on repellents, perhaps here also the sharks are keeping ahead, but shorter articles on social organisation, water regulation, respiration and so on give helpful accounts of modern work. But this is necessarily a personal choice, no reviewer could presume to assess all the variegated topics included; this book, therefore, should be available in all the appropriate libraries where those interested in the group can select the articles bearing upon their own research.

T.K.

Functional design in fishes by R. McN. Alexander. Pp. 160 with 16 text figures. Hutchinson University Library, 1967. Paperback 10/6, Hardback 25/-.

Anatomy and function may be the two sides of one coin but most discussions about animals show a strong bias towards the one or the other, so it is a pleasure to welcome a book in which the author has attempted and achieved a happy balance between the two. In turn this requires some consideration of the physical principles involved in the performance of the functions and such have been skilfully introduced to illuminate, rather than obliterate, the zoological aspects. In his Preface the author mentions that he has selected topics of particular interest to himself but this makes for interesting reading and few readers will fail to find interesting chapters in this book — with the proviso that the fascinating fish depicted on the cover does not appear in the text.

T.K.

Thorburn's Birds, edited with an introduction and new text by **James Fisher**. 82 coloured plates by Archibald Thorburn; two end paper maps. Ebury Press and Michael Joseph. London, 1967. 50/-.

It is now over fifty years since Archibald Thorburn's great four-volume *British Birds* with its 82 coloured plates first thrilled an earlier generation of birdwatchers. He was certainly the best British bird artist of the nineteenth century and he portrayed his subjects living in their natural niches, as we can see from the deftest of environmental hints. In the mind's eye of many a schoolboy who was brought up on these volumes, the ideal Golden Eagle forever snatches a blood-stained mountain hare from an icy mountain-side (plate 32) whilst the Osprey rips the flesh from the fish at the side of the loch (plate 33). The plates are notable not only for their high scientific accuracy and exactness of detail but also for their distinction as works of art and the volumes are now regarded as collector's pieces.

In this new single-volume edition all the plates, reduced from the original quarto to about 9" x 7", are available between one pair of covers and have been very faithfully reproduced. James Fisher's new text begins with a biographical introduction and a list of all the works, and they are legion, in which Thorburn's pictures have appeared. The plates have been rearranged to follow Fisher and Peterson's 1964 classification and the short text, which appears on the page opposite to the illustration for each species, deals with its status and history in Britain, its probable origins and its world distribution. Species added since Thorburn's day are given a text in the appropriate places marked 'not illustrated' and the 'Hastings rarities' are retained in square brackets. The text is up-to-date and special mention is made of changes and conservation problems. For a book of this quality the price is reasonable and those glorious plates will thrill a younger generation of birdwatchers just as they thrilled their grandfathers fifty years ago. D.F.W.

Neeka the Kestrel by **David Rook**. Pp. 65 with 40 charcoal drawings by the author. Vernon & Yates. 1967. 25/-.

This volume describes the author's first adventures in the art of falconry, experimenting with a Lesser Kestrel 'taken' as a fledgling from the battlements of an ancient Spanish castle.

David Rook is already well known as the illustrator of Joyce Stranger's best selling novel *The Running Foxes*, and here he again displays his obvious artistic talent with a series of forty sensitive charcoal drawings. Unfortunately, the text shows a disturbing eagerness in urging others to follow his example of depriving young birds of prey of their freedom. An appeal in the closing paragraph for the conservation of wild life would appear rather hypocritical in view of his statement that he intends to pay a further visit to Spain to obtain another bird as a companion for 'Neeka'.

The keen falconer will learn little from this book; the bird lover and conservationist should be dismayed by some of the attitudes adopted. T.G.G.

Owl. The House Magazine of The Three Owls Bird Sanctuary.

During the past three years, with enlightened help from the County Borough authority, Mrs. Eileen Watkinson has established a bird hospital with aviaries in Oldham's public Alexandra Park. The nursing and feeding of up to 150 birds, together with general maintenance of Three Owls Sanctuary obviously makes a great demand on available resources.

One way in which naturalists can support this project is by subscribing to a new bi-monthly magazine *Owl*, the first issue of which appeared on 1st March, 1968. In doing so, they will also find much of interest in its twelve pages. The present issue contains articles on 'The Trade in Birds of Prey' by K. G. Spencer (which all protectionists should read) and on 'Chaffinches' by John Armitage.

Single issues at 2/- or a year's issues at 12/- (post free), may be ordered from Owl Magazine, The Three Owls Sanctuary, 19 Queen's Road, Oldham, Lancs.

World Vegetation by **D. Riley** and **A. Young**. Pp. 96 with 122 photographs, 4 colour plates and one map. Cambridge University Press. 1968. 15/-.

The original edition was published in 1966 and was reviewed in *The Naturalist* 68, 1967. This is a hardback reprint. The book surveys the major world vegetation types and their relation to climatic and soil conditions and is notable for the quantity and uniformly high quality of the photographs.

Debate about the Earth: Approach to Geophysics through Analysis of Continental Drift by **H. Takeuchi, S. Uyeda and H. Kanamori**. Pp. 253 with 120 figures and 4 tables. Freeman, Cooper and Co., San Francisco. 1967.

Of late years there has been a revival of interest in the Continental Drift theory. Modern techniques in geophysics and various branches of earth science such as rock magnetism and oceanography have yielded data highly relevant to the concept of shifting continents. The purpose of this book is to present the case for and against the theory in the light of recent findings bearing upon it.

The book grew out of a television programme which was amplified for publication in Japan and which has now been further expanded and translated. Much of the data pertinent to the drift hypothesis is technical to a degree beyond the comprehension of the non-specialist reader and the skilful and effective way in which this is presented in a manner which is not merely intelligible but absorbing and stimulating deserves the highest praise. Ever since Wegener first advanced the theory of continental drift, plant and animal geographers, for whom it explains so many otherwise intractable problems, have been predisposed in its favour. The recent rehabilitation of the theory is a matter which is of the greatest interest to them and this book will be of particular value to biologists for the understanding which it provides of a complex subject the resolution of which has such an important bearing on their own studies. W.A.S.

Caddis Larvae by **Norman Hickin**. Pp. 476 with 980 illustrations in the text. Hutchinson. 1967. £10 10s. net.

This book is the outcome of thirty years of intensive study of caddis fly larvae by Dr. Hickin. Rather less than 200 species of caddis are known from Britain and of these 82 are described in detail from British specimens and many more from European sources. There are four chapters on the general biology of Trichoptera, one on technical details of preserving, rearing, etc., and one on each of the 14 families on the British list. These last are gems of precision treatment, each one contains a check list of native species, a general description of larvae, a detailed description, where possible, of individual species, a key and a bibliography.

One cannot but admire the high class of this book, its orderly arrangement, its numerous first-rate drawings, in fact its professional competence combined with a sort of amateur enthusiasm which makes it a pleasure to use and to read. Every 'Trichopterist' and fresh water biologist will have to buy or borrow it and no doubt it will inspire many to become devotees of the group if they are not already so.

If criticism there must be it is already recognised by the author to lie in a certain lack of precision nomenclature in detailed descriptions. This is a common state of affairs in many fields of entomology and one not likely to be resolved for a long time yet. One may also regret the very high price, but the quality of production and wealth of illustration presumably dictate this. The thanks of all entomologists should go to Dr. Hickin and his colleagues on Rentokil for making his hard-won knowledge available, even if at a daunting price. H.H.

A Key to the Adults and Nymphs of the British Stoneflies (Plecoptera) with notes on their ecology and distribution by **H. B. Hynes**. Pp. 91. Freshwater Biological Association, Scientific Publication No. 17. Second revised edition, 1967. 6/-.

This excellent handbook replaces the edition of 1957. There are a few alterations to the text and figures and the distribution maps have been revised. The distribution maps are on the vice-county system and might be regarded as an invitation to entomologists to fill some of the gaps. J.H.F.

Your Book of Freshwater Life by **John Clegg**. Pp. 55 with one coloured and 12 black and white plates. Faber. 1968. 15/-.

An attractively presented and admirable introduction to pond life, suitable for the eleven to thirteen-year-old. Here are illustrated and succinctly described representatives of most of the familiar animals, and a few of the microscopic plants, that the young pond-hunter will find. The book is completed by suitable instructions on easily acquired collecting equipment, what to do, sensible advice on joining a natural history society and a suitable guide to further reading. It must be said, however, that some of the photographs are not so clear and the price is rather high. J.H.F.

The Entomologist's Record

and Journal of Variation

A monthly illustrated magazine, founded by J. W. Tutt in 1890, is devoted mainly to the Lepidoptera of the British Isles. It also deals with other orders of insects especially Coleoptera, Diptera, Hymenoptera, Orthoptera. Its articles include descriptions of new species and varieties, reports on collecting trips, distribution, habits and habitats of insects and of collecting and study techniques suitable for novice and expert. It circulates in 47 countries.

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IRISH NATURALISTS' JOURNAL

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THE YORKSHIRE NATURALISTS' UNION

ORNITHOLOGICAL SECTION

Preliminary Notice: In conjunction with Bradford Naturalists' Society, the Ornithological Section is arranging a public film show to take place on Friday, 8th November, 1968 at 7.30 p.m. in Victoria Hall, Saltaire.

A colour film entitled 'Norfolk Bird Life through the Seasons' will be shown. The film has been produced by Mr. R. P. Bagnall-Oakley who will be giving a live commentary.

Harrogate and District Naturalists' Society, in conjunction with the R.S.P.B., is sponsoring a showing of R.S.P.B. films at the Royal Hall, Harrogate on 27th November. The capacity of the Hall is 1,300 so it is hoped that other societies and individual members will make this event widely known.

Would members please note that records for Vice-County 63 should now be sent to C. Bower, 17 Woodland Rise, Silkstone Common, Nr. Barnsley, who has succeeded J. Cudworth as Ornithological Recorder for that area.

The R.S.P.B. requests that anyone who discovers any bodies of oiled seabirds report the matter to them. Forms for reporting these are available from the R.S.P.B. at The Lodge, Sandy, Beds.

Members who have not paid their subscription for 1968 are requested to forward same to the Assistant Treasurer, Mr. G. A. Shaw, without delay.

Annual Subscription 30/- (post free) payable in advance to The Yorkshire Naturalists' Union, The University, Leeds 2.

MODERN NATURAL HISTORY

G. C. VARLEY

Hope Department of Zoology (Entomology), Oxford.

*Presidential Address to the Yorkshire Naturalists' Union, Barnsley,
2nd December, 1967.*

I am very conscious of the honour you have done me by electing me as your President because the Y.N.U. has such strong connections with many distinguished amateur naturalists whose work and enthusiasm have been an inspiration to many including myself.

As a boy I was a frequent visitor to the Tolson Memorial Museum in Huddersfield. There I met Dr. Woodhead and received a lot of encouragement from that great naturalist Ben Morley. He had a very wide knowledge of the local insects and kindly directed me to many delightful collecting areas and helped me especially with the Microlepidoptera. In 1953 I was with a party of members of the British Ecological Society who were lucky enough to be shown some of the country round Malham by that veteran Yorkshireman Chris Cheetham. However, there is no doubt that for me the most influential member of the Y.N.U. has been Douglas Hincks. His biggest impact on entomology came with the publication of the Kloet and Hincks *Check list of British Insects*, published in Stockport in 1947. The Royal Entomological Society of London has recognised its value and is organizing the publication of a revision; the Y.N.U. should be justly proud that the names of these two amateurs will still appear on the revised list.

This revised edition is proving difficult to prepare because we still do not agree how to define a species, and modern definitions are hard to apply. We still do not know what insect species are present even in well worked parts of the country.

An illustration of this arose during a walk in Blenheim Park with my children in 1964. There we found on the blades of the common grass *Brachypodium pinnatum* some white fluffy waxy objects half an inch long which proved to be the ovisacs of scale insects (Fig. 1). Afterwards I found the same scale insects were locally abundant

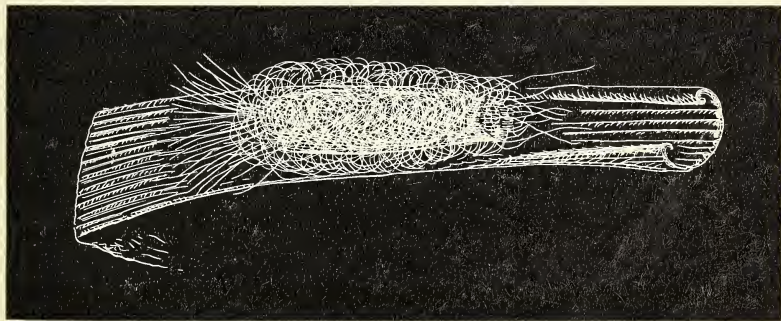


Fig. 1. The white waxy ovisac of the scale insect *Eriopeltis* ? *strelkovi* Borchs. on a blade of the grass *Brachypodium pinnatum*, in winter.

on Rough Common at Wytham, just over the county boundary in Berkshire. As these scale insects proved to be attacked by interesting predators and parasites I collected some hundreds and used them in the Oxford Zoology course to illustrate the principles of biological control of pests. Identification of the insects has proved difficult and all we can be quite sure of is that the scale insect is a species of *Eriopeltis*, but not the one on the British list, and that the predatory fly larva is a species of *Leucopis* which is also new to Britain.

The ease with which discoveries can be made applies not only to small and obscure insects which are neglected by most amateurs. Even the moths, so assiduously studied by many keen collectors, present many problems of identification and we still know remarkably little about how they live. Few collectors realise that the males of many common moths have complex scent brushes, some of which I described in 1962.

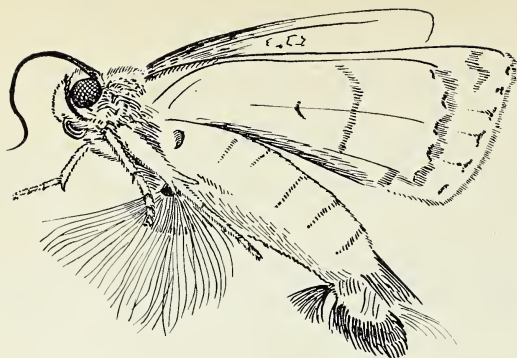


Fig. 2. Dark Arches moth (*Apamea monoglypha* (Hafn.)) inflated to show the big scent brush at the base of the abdomen and the smaller ventral brush in front of the genitalia of the male.

The abundant Dark Arches moth (*Apamea monoglypha*) (Fig. 2) has a pair of large scent brushes which are normally hidden in pouches on either side of the body. Although the brush can be dug out with a pin, it is often simpler if the moth is pierced with a hypodermic needle and inflated. It can be dried in the expanded position as in the figure. Few entomologists have ever observed these brushes in action but Aplin and Birch (1968) have found that the aroma of almonds from the brushes of some of the wainscot moths (*Leucania* spp.) is associated with the presence of benzaldehyde.



Fig. 3. Garden Carpet moth (*Xanthorhoe fluctuata* (L.)) inflated to show large terminal coremata in the male.

Many male geometers, like the Garden Carpet (*Xanthorhoe fluctuata*) (Fig. 3) have beautiful brushes at the hind end of the body which have no smell that I can detect. These organs seem to be inflated by the male when first the female is touched, but observations of this kind have yet to be made for the majority of species in which such organs are known to be present. Here is a good chance for the careful amateur to make entirely new observations and have a great deal of fun trying to find how these strange structures are employed in the moth's courtship. Many British insects also have special glands which produce distasteful substances, as in many of the tiger moths (Fig. 4). The reactions of birds and other insect-eating animals to these have scarcely been studied at all. Tame birds, domestic cats or mice react to different insects in a way that reveals that many of our gaudy insects are rejected.

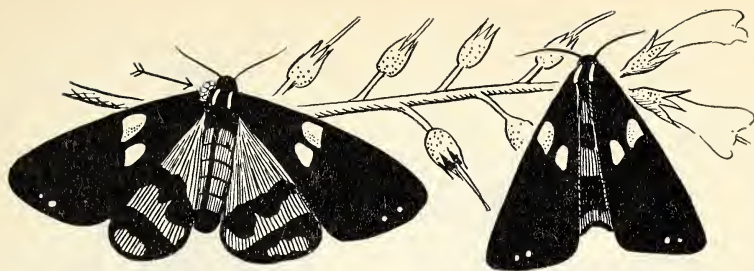


Fig. 4. Scarlet tiger moth (*Panaxia dominula* (L.)). At rest (right) and displaying after disturbance (left). Note arrow pointing to brown frothy secretion.

The amateur lepidopterist can help with the nationwide distribution study which is being organised by the Nature Conservancy and the British Trust for Entomology. Any of you interested to help should get in touch with Mr. Heath at the Biological Records Centre, Monks Wood Experimental Station, Abbots Ripton, Hunts., or your county representative.

Another useful thing which amateurs can assist with is the recording of migrant insects which is organised by Mr. French at Rothamstead Experimental Station, Harpenden, Herts.

Nature photography has become very much easier of recent years with single lens reflex cameras which permit close-up pictures of plants and animals. This enables the modern naturalist to record interesting events in colour and of course simplifies the giving of a talk such as this. However, I must interject a word of warning here. Not only have bird photographers unwittingly exposed their subjects to unusual risk by making paths to the nests, or by keeping the parent birds away from the nest for too long, but the photographers of rare plants have often damaged by trampling many non-flowering orchid plants in their efforts to photograph a prime specimen. Preservation of our rare orchids, of which Yorkshire has its fair share, is a difficult problem because many are conspicuous and may be picked by the ignorant simply for their beauty or picked for preservation by the over-ardent collector. To keep secret the locality of a rarity may be unwise if the area is in danger of destruction. This destruction might be avoidable if the facts were known. Yet the knowledge of the facts by the wrong people can in itself be a danger. We must seek by our own example to give the younger generation of naturalists a properly responsible attitude to these matters.

The scope of modern natural history where the amateur can make his mark is still vast, because although the life-histories of over half the British insects may be known in outline or by inference, the lives of less than a tenth are known in any detail. It is easy to stumble on something quite new, as I did as a student in Cambridge by pulling up the roots of the reedgrass (*Glyceria maxima*) from beside the river Cam. There I found what I was seeking — the larvae of the beetle *Donacia* (Fig. 5: 2) which get their oxygen by piercing the plant roots. At the same time I stumbled on what is, I think, a very remarkable example of convergent evolution — the adaptation of different un-related insects to the same specialised role. In Cambridge I found and described (1937) the larvae of the hover-fly *Chrysogaster hirtella* (Fig. 5: 9, 10 & 11) which has the openings of the breathing system on the sides of a single dagger-like spiracle with which it pierces the air spaces of plant roots. When fully grown in spring the larva leaves the mud and pupates above water level. The larva of the small Ephydrid fly *Notiphila riparia* has a pair of daggers at the hind end on which the spiracles open (Fig. 5: 13). The larva forms its brown puparium in spring whilst firmly attached to a root (Fig. 5: 14). Years later, near Oxford, I searched again amongst the reedgrass roots and found a third kind of fly larva, that of the small crane-fly *Erioptera squalida* which at first sight seemed not to be adapted in any special way. When, under pressure, the hind spiracles were extruded they too were sharp and it is very probable that these larvae also pierce the roots. When they pupate, the main spiracles are on

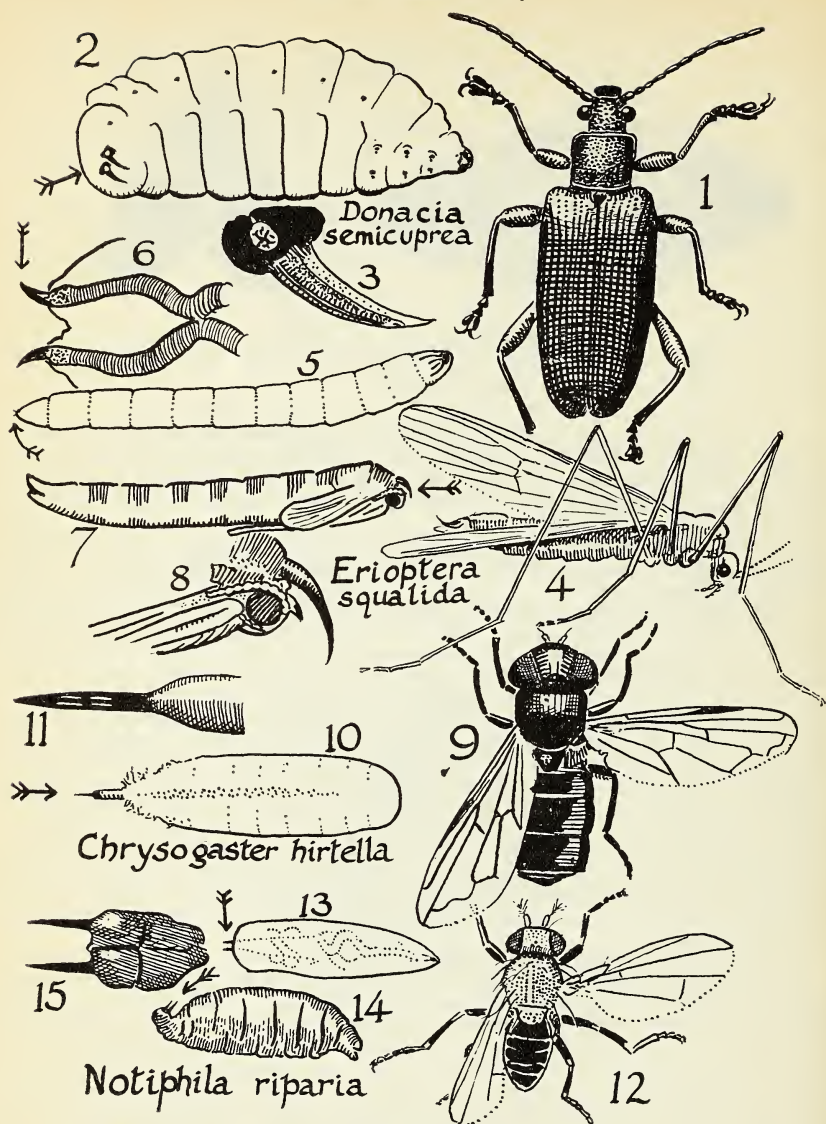


Fig. 5. Insects whose larvae or pupae live in de-oxygenated mud and get their oxygen from roots of the grass *Glyceria maxima*.

Donacia semicuprea Panz. (Chrysomelidae) 1, adult beetle; 2, larva with hind spiracles like daggers; 3, detail of larval hind spiracle.

Erioptera squalida Loew. (Tipulidae) 4, adult fly; 5, larva; 6, detail of larval hind spiracles; 7, pupa with spiracular daggers; 8, detail of pupal prothoracic spiracle.

Chrysogaster hirtella Loew (Syrphidae) 9, adult hover fly; 10, larva; 11, detail of larval hind spiracle.

Notiphila riparia Mg. (Ephydriidae) 12, adult fly; 13, larva; 14, puparium; 15, detail of paired hind spiracular daggers.

the prothorax and are in the form of long daggers. The head and prothorax can nod actively and thus thrust the daggers into a root. How the fly eventually emerges from the mud has not been observed.

My present work in Oxford concerns the populations of defoliating caterpillars on oaks, especially the winter moth. This and the many other species of caterpillars present are often parasitised by tachinid flies or by various parasitic Hymenoptera. The life histories of these parasites have fascinated me ever since my student days because of their bewildering variety. Collectors of caterpillars are familiar with the idea that adult parasites sting their hosts and lay eggs in them or on them. One of the commonest parasites of winter moth (*Operophtera brumata*) is the tachinid fly *Cyzenis albicans* which adopts another method to infect the host. The eggs are very small — only 0.2 mm. in length — and are deposited on the underside of a leaf close to where a winter moth larva has been feeding. The egg contains a maggot ready to hatch and, if it is swallowed whole, the tiny maggot hatches in the caterpillar's gut, bores into its body, and enters a labial gland cell. The winter moth caterpillar finishes feeding, and not until it is a pupa in its underground cocoon does the parasite maggot finally destroy it. Although probably all of the many oak-feeding caterpillars swallow these eggs under natural conditions, *Cyzenis* larvae fail to develop in almost all of them. Experimentally we have reared it from the Northern Winter moth, *O. fagata*, by putting the eggs on its food. We still know very little about the host range of these parasitic insects. For perhaps half of the British species no host is yet known. Here is another field of study in which amateur collectors may give valuable service, by carefully retaining, mounting and labelling any parasitic species reared. To be useful, all the host remains and the parasite cocoon or puparium should be kept together with the emerged adult. In Oxford, with help from many quarters, we are slowly building up our collection of reared parasites which will eventually be a valuable source of breeding records.

Such a collection also provides information about the structure of the larvae of these parasites. From the cocoon of an ichneumon fly the cast skin of the larva can be removed and prepared for microscopic examination: similarly the puparium of a parasitic tachinid fly incorporates all the important external structures of the larva such as the spiracles and the mouth parts. Curiously enough the structural differences between these larval stages are often easier to appreciate than differences in adult structure and they provide a remarkably good guide to the classification of the adults. What is more, they reveal more clearly than other evidence those cases where species have been incorrectly placed in the classification.

The modern naturalist can contribute enormously to the sum of useful human knowledge by his or her observations. I am confident that the present members will continue to maintain and indeed enhance the high reputation of the Y.N.U. in this respect. We all get very great satisfaction in making new discoveries, however small. My final word is to exhort you to put more effort into the rather more difficult task of communicating your discoveries to others through the medium of publication.

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Knaresborough Ringing Station, Report for 1967, edited by J. R. Mather and obtainable from him at 44 Aspin Lane, Knaresborough at 2/6 per copy.

This is not merely a systematic list of the species recorded and ringed in the area covered by this very active group. There is also a detailed account of the passage of warblers through the area. One section describes how the ringing group exploited a temporary glut of birds attracted by uncut barley. Bird ectoparasites collected in the course of their work are listed. Throughout is ample evidence of intensive study of birds in the hand, as opposed to 'ring and sling' techniques and it is pleasing to note that educational use has been made of the station's activities. A commendable report on which the Knaresborough ringing station committee are to be congratulated.

MARINE FISHES AT SCARBOROUGH

D. E. WHITTAKER

During January, February and March 1968, I have collected many specimens from the local keel-boats, including one species new to the Yorkshire list. All the important specimens are preserved at Scarborough, either in my own collection, or as a duplicate in a collection at the Wood End Museum.

The most interesting specimen is a small shark, known as the Smooth Hound (*Mustelus mustelus* (Linn.)) that was trawled by the *Onward Star* on 19th February. The *Handbook of Yorkshire Vertebrata* gives no definite records for this species but simply states that it is said to occur in the bays of Bridlington and Scarborough. The late W. J. Clarke never saw a specimen of this species at Scarborough, although he studied the fishes here for almost sixty years. The Smooth Hound is very similar to the common Tope. The chief distinguishing feature lies in the form of the teeth, which in the former are very low and smooth, while those of the Tope are distinctly pointed with very sharp cutting edges.

On 24th February I was given a specimen of the Sea Lamprey (*Petromyzon marinus* Linn.) 31" long which had been found trapped near the propeller of the pilot-coble, moored in Scarborough harbour. This species is now comparatively rare in the North Sea, and very few of the local fishermen had ever seen a specimen. Mr. Clarke notes that the majority of Tunny that he saw landed at Scarborough bore evidence of attacks by the Sea Lamprey, and that they are probably more common than we would believe. The Tunny however is a seasonal visitor to our waters, and hence the majority of scars will have been caused by attacks outside the North Sea.

While searching through a large amount of cod-end rubbish from one of the local keel-boats on 28th February, I came across a small fish about 7" long, which proved to be an example of the Norway Pout (*Gadus esmarkii*, Nilsson), an addition to the Yorkshire list, but a species which is abundant in some areas in the North Sea.

Other rarely-seen fish that I have received are as follows:

Red Sea Bream (*Pagellus centrodontus* (De la Roche)), one specimen trawled about 10 miles E.N.E. of Scarborough by the *Sincere* on 18th January.

Twaite Shad (*Alosa finta* (Cuvier)), one perfect specimen trawled by the *Onward Star* on 1st February. This giant member of the herring family is known to the local fishermen as the 'Rock Herring'.

Lesser Fork-beard (*Raniceps raninus* (Linn.)), one specimen trawled about two miles off Flamborough Head on 8th February by the *Utilise*.

Common Topknot (*Zeugopterus punctatus* (Bloch)), two specimens, one on 2nd February and the second on 9th February, both trawled by *Our Margaret*.

More usual specimens that have been trawled during the past three months are:

Lesser Spotted Dogfish (*Scyliorhinus caniculus* (Linn.)), one, trawled by *Onward Star* on 16th January. One caught on long-line 29th January. One trawled on 31st January by the *Onward Star* was tagged with a plastic marker and released at Scarborough on 16th February.

Pogge (*Agonus cataphractus* (Linn.)), two specimens trawled by the *F. & S. Colling* and the *Onward Star* on 10th January and 1st March respectively.

John Dory (*Zeus faber* Linn.), one on 5th January by the *F. & S. Colling*, one on 19th February by the *Onward Star*, and the last trawled off Robin Hood's Bay on 20th February by the *Sincere*.

The approach of the breeding season of the Lumpsucker (*Cyclopterus lumpus*, Linn.) was well marked by the movement and consequently frequent capture of specimens by the local boats, some quite large specimens being taken:

16 January One male 13½" long, 3 lb. 12 oz. in weight, by the *Onward Star*.

17 January One male 18" long, 11 lb. 6 oz. in weight, by the *Progressive*.

19 January One male, one female, by *F. & S. Colling*.

29 January One female about 12" long, by the *Sincere*.

31 January One male, by the *Onward Star*.

1 February One small female, by the *Onward Star*.

2 February One female, again by the *Onward Star*.

8 February One female 12" long, off Flamborough, by the *Success*.

12 February Three, including two males from the *Onward Star*. A fourth specimen, a female, was caught by the *Progressive*.

13 February One very large female, approximately 22" long, from the *Onward Star*.

THE AUTUMN MIGRATION OF WADERS THROUGH THE INNER RIBBLE MARSHES, LANCASHIRE

M. E. GREENHALGH

The Inner Ribble Marshes, Lancashire are situated along the Ribble estuary between Preston and Freckleton, a length of about four miles. Here the estuary channel is narrow, being only about 200 yards wide at its widest point in the west. The area on the north side where this study was made includes two saltmarshes, extensive low-lying alluvial fields behind the river embankment and Freckleton sewage farm.

Between 1963 and 1966 I made weekly visits to this area and in 1967 attempted a close coverage of between two and five days each week. On each visit the same area was covered. Intense observation was maintained from late June to November although odd weeks were missed in the years 1963-6. During each visit a full count was made of all the waders present in the study area. In 1967 I was able to supplement my counts with those made by my brother, P. A. Greenhalgh, in the same area.

Several facts emerged from this study. The time of day has a great effect on the wader numbers in an area: they may spend the night at one site, some leaving for another in the early morning and spreading through the estuary as the day progresses. As dusk falls they may return to the previous night's site. Tidal rhythm also affects wader distribution in the estuary. At low tide some waders left the study area and would not be counted. Also, at very high tides when the outer marshes not included in the study were completely covered, the waders were driven off and some came into the study area. In this latter case the count would be high, not necessarily due to real migration, but to local movement. One must be cautious therefore when dealing with wader counts in discerning between true migrations and local movements due to tidal, diurnal or other causes. In 1967 disturbance factors and variation in numbers due to tide, weather and time of observation were noted.

REGULAR AUTUMN MIGRANTS

Three species which breed in and around the study area will not be dealt with as a study of them is not completed. These are the Oystercatcher (*Haematopus ostralegus*), Lapwing (*Vanellus vanellus*) and Curlew (*Numenius arquata*). In this section I will deal with thirteen species which are regular passage migrants in autumn through this area.

RINGED PLOVER (*Charadrius hiaticula*).

Ringed Plovers begin passing through the area in mid-July and their numbers show two short well-defined peaks, one falling in late July to early August and the other in early September (figure 1). Since 1963 the observed peaks have varied between 40 and 100 and in some years the two have been of similar size (e.g. as in 1967) but in other years the second peaks have been lower.

The reason for these two peaks is obscure. Possibly the earlier peak is that of the passage of British and near European stock whilst the second consists of the arctic populations. This is suggested by ringing data and by observations on the breeding populations and migrants in other areas. Witherby *et al.* (1943) stated that only a few breeding birds remain in their nesting grounds after mid-July whilst many in northern areas move south before late August. Birds from the continent pass through Britain from August onwards.

More recent data from ringing has enabled the migrations of Ringed Plover through Britain to be more clearly defined. Bannerman (1961) noted that the nominate race (*C. hiaticula hiaticula*) which breeds as far north as Greenland, Iceland and Scandinavia leaves the breeding sites in July and August wintering south to the Mediterranean. He also noted that the arctic race (*C. hiaticula tundræ*) has a peak passage through Britain in late August and the first three weeks of September.

It is difficult to interpret some ringing data as many birds are ringed on migration, not on their breeding grounds, and measurements which could indicate racial affinities are rarely taken. However, the following two recoveries indicate the probable pattern. The first is of the nominate race which forms the first peak and which also winters in Britain, whilst the second is a recovery of the arctic race: Ringed 11/6/63 Frisian Islands, Germany; Recovered 17/8/63 in Lincoln. Ringed 21/8/58 Lincoln; Recovered 15/7/62 in Murmansk, U.S.S.R. (Data from Spencer, 1963 and Hudson, 1964).

It is also possible in some cases to identify the arctic race and very dark brown birds which I have seen in the second peak were probably *tundræ*. On 23 August, 1967 I found a Ringed Plover dead in the study area with a wing of 123 mm., a tarsus of 24 mm. and bill (from feathers) of 13.5 mm. This was probably an arctic bird.

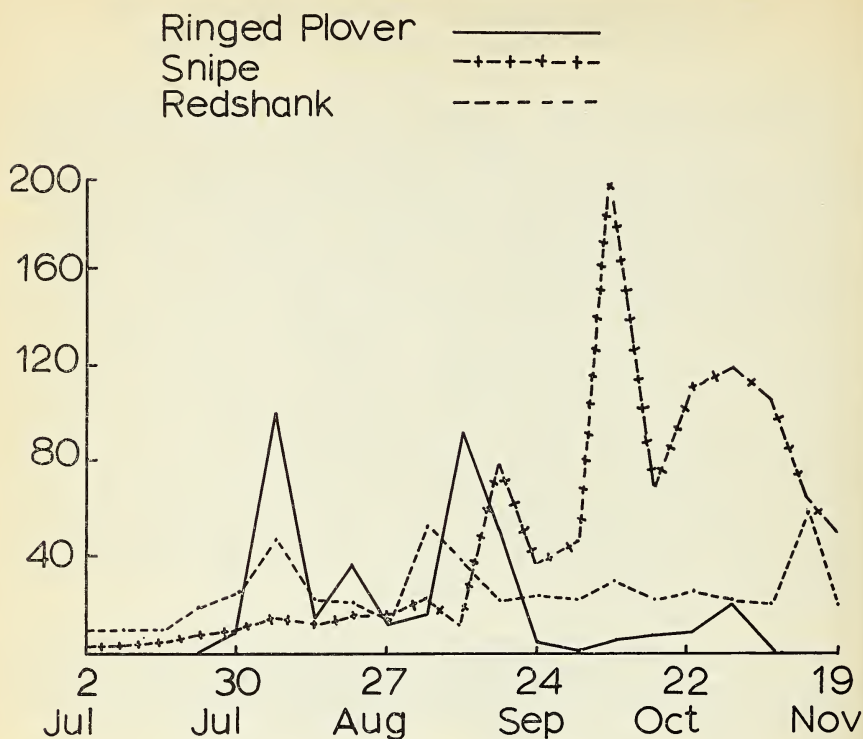


Fig. 1. The numbers of Ringed Plover (*Charadrius hiaticula*), Snipe (*Capella gallinago*) and Redshank (*Tringa totanus*) at the Inner Ribble Marshes, Autumn, 1967.

GOLDEN PLOVER (*Pluvialis apricaria*).

First arrivals of this species appear in late July as a rule although I have one record in June. Numbers remain small into August followed by a rapid build-up to early September (table 1).

From north-eastern England, Evans (1966) noted three periods of autumn immigration of Golden Plovers. He suggested that the first arrivals in July and early August consist of British birds which have moved to the coast. This is followed by an influx from mid-August to October consisting of southern birds (*apricarius*) with a final passage from early October to November involving northern birds (*altifrons*). It is impossible to define some of the fluctuations on the Ribble. Certainly the arrivals up to September often include the southern form, identifiable in summer plumage, whilst it is later that the northern form occurs. However, the separation of these two forms and their validity is very debatable (see Bannerman, 1961) and during autumn when the birds are moulting racial identification is doubtful.

It can also be very difficult with this species to say if some of the fluctuations which occur are due to migrations or just local movements. Some are definitely local, the large flocks ranging throughout the estuary.

SNIPES (*Capella gallinago*).

Although odd pairs may breed in and around the study area the Snipe occurs mainly on the Ribble estuary as a passage migrant and winter visitor. A few birds appear in late June and early July, but it is not until late August and September that large numbers pass through (figure 1). The earlier influxes are probably adults of British origin which have failed to breed and the first juveniles, followed by more juveniles and adults which have completed their post-breeding moult. Later influxes may be of Siberian, Scandinavian or Icelandic stock.

TABLE I

The weekly peaks of Golden Plover (*Pluvialis apricaria*) at the Inner Ribble Marshes in autumn 1967.

-30 July	-6 Aug.	-13 Aug.	-20 Aug.	-27 Aug.	-3 Sep.	-10 Sep.
0	1	0	0	4	800	1100
-17 Sep.	-24 Sep.	-1 Oct.	-8 Oct.	-15 Oct.	-22 Oct.	-29 Oct.
550	650	20	800	400	8	1500

Snipe are one of the most difficult species to count due to their secretive habits. Furthermore, this is accentuated by the effects of differing amounts of water in the habitat. When the area is dry very few Snipe can be found, yet the next day after light rainfall the species may be abundant. The highest counts are made when the area is flooded. For example, October 1967 was an extremely wet month and consequently the fields were flooded in places to a depth of several feet. This resulted in some very high counts. How much these were due to migrational influxes, local movements or simply to the water covering most grass and revealing the Snipe it is impossible to say.

It is also possible for extensive flooding to have the opposite effect by driving birds right out of the area.

GREEN AND WOOD SANDPIPERS (*Tringa ochropus*) and (*T. glareola*).

The numbers of both these species passing through the study area are always small, my highest count of Green Sandpipers being three in 1966 and that of Wood Sandpipers being four in 1963. Their appearance often coincides with easterly winds but this is not necessarily so. Green Sandpipers can appear any time from July to September, Wood Sandpipers from late July to October with one November record in 1964.

COMMON SANDPIPER (*Tringa hypoleucos*).

The autumn migration of the Common Sandpiper through the Inner Ribble Marshes probably mainly concerns the passage of British breeding birds on their southerly movement. Some may be Scandinavian birds which appear, from two recoveries of birds ringed in Essex, to pass through Britain (Spencer, 1966).

The first migrants appear in late June and these early birds are probably either non-breeders or have failed to breed successfully. Largest numbers pass through in July and early August with peaks of up to 32 (*Lancashire Bird Report* for 1963). In 1967 the peak was only five, and this may indicate a poor breeding season. Stragglers remain up to early October.

REDSHANK (*Tringa totanus*).

In Lancashire, including the Inner Ribble Marshes, the Redshank breeds commonly on coastal marshes and fields. The first autumn influxes occur in the latter half of July reaching a peak between late July and September (figure 1). After this it is difficult to separate fluctuations due to tide conditions from migrational fluctuations and hence it is difficult to pinpoint major influxes with any accuracy.

Again, the early arrivals are possibly local birds whilst later ones may be of more distant northern origin. There is also the possibility that some influxes may consist of some separate age or sex groups. It is impossible to separate ages and sexes in the field with this species so that proving or disproving this is extremely difficult. It is certain that some birds from Iceland pass through the area as I have examined Redshanks of wing length greater than 170 mm. on the Ribble and these are referable to the Icelandic race *T. totanus robustus* (Harrison, 1961).

SPOTTED REDSHANK (*Tringa erythropus*).

This species, which breeds in arctic Europe and Asia, is a regular migrant to the Inner Ribble Marshes in small numbers, arrivals often coinciding with an easterly airstream. Numbers are never large in the area (Table 2), up to five being recorded in most autumns. Birds arrive early in August and the last are usually seen in October.

TABLE 2

The maximum counts of Spotted Redshank (*Tringa erythropus*), Greenshank (*T. nebularia*), Little Stint (*Calidris minutus*) and Curlew Sandpiper (*C. testacea*) at the Inner Ribble Marshes since 1963.

	Spotted Redshank	Greenshank	Little Stint	Curlew Sandpiper
1963	1	7	1	9
1964	12	7	8	15
1965	4	4	7	17*
1966	5	5	6	22
1967	4	2	31	10

* This figure is from *Lancs. Bird Report* for 1965.

GREENSHANK (*Tringa nebularia*).

The Greenshank is a regular migrant in small numbers on autumn passage (table 2). Occasionally odd non-breeders summer or pass through in June. From then onwards until November passage continues, the largest numbers being recorded from August to October, generally with peaks of less than ten. Some stragglers may remain and winter in the area.

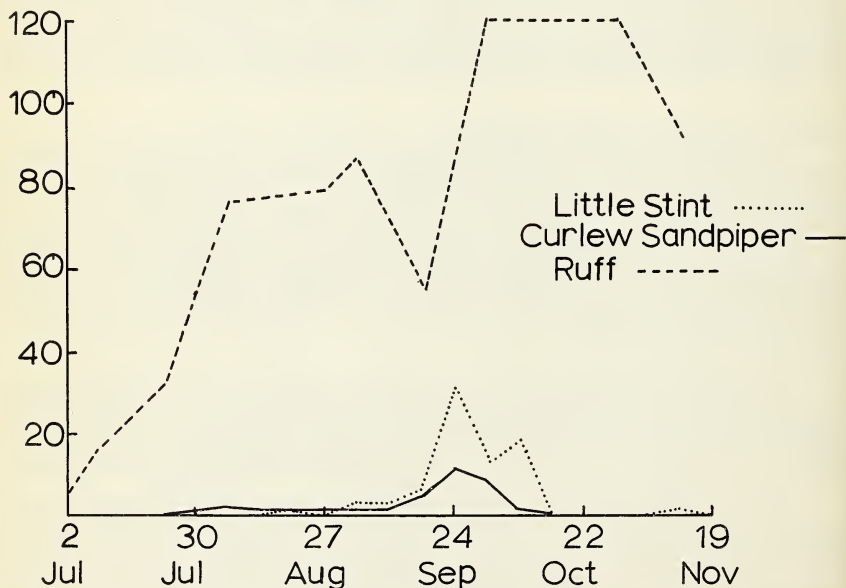


Fig. 2. The numbers of Little Stint (*Calidris minutus*), Curlew Sandpiper (*C. testacea*) and Ruff (*Philomachus pugnax*) at the Inner Ribble Marshes, Autumn, 1967.

LITTLE STINT (*Calidris minutus*).

This species is a regular passage migrant through the Ribble estuary, although numbers depend on weather conditions. With a strong easterly airstream quite large numbers may be present in the area; in most autumns up to ten occur (table 2). First arrivals appear in late July and early August, the earliest date being 9 July in 1963. Largest numbers arrive in September or October and these peaks, which consist mainly of juveniles, usually coincide with falls of Curlew Sandpipers (figure 2).

In recent years there have been two large influxes associated with easterly winds. In 1960, when Britain was visited by exceptional numbers of stints, a peak of 49 was counted in the study area. In 1967 a further large influx brought many stints to Lancashire and I noted many birds during September from Southport north to Walney Is., with a peak in the study area of 31 on 21st September.

DUNLIN (*Calidris alpina*).

A small number of Dunlin may summer on the Ribble estuary. The first migrants arrive in early July after which there is a rapid build-up to a peak in late July and early August. The size of this peak is dependent to a certain extent on tide conditions: at high tide there is a movement into the area of some birds from the estuary mudflats.

There appears in some years to be a two-peaked passage with the first peak in late July and early August, the second in September or October. In other years these two peaks may be more or less merged. In this respect the Dunlin is similar to Ringed Plover, and to some extent the numbers of these two species parallel each other.

There has been much debate as to the origins of the autumn migrant Dunlins in northern England. Brady (1949) recorded two peaks at Fenham Flats, Northumberland in late July and September which appear to coincide with those I have noted on the Ribble. Evans (1966) described a rather more complex situation in Northumberland and suggested that the first July immigrants may be local or Scottish-bred birds. He then suggested from the available evidence that the juvenile Dunlins which pass through north-east England in August come chiefly from Iceland and possibly also from Greenland and the September arrivals are probably of Scandinavian origin.

This may well be the pattern for the west coast of northern England also. However there is need for more data and a group of Lancashire ornithologists, including myself, is working on the origin and migration of many waders, including the Dunlin, through north-west England using ringing, measurements and regular counts in several areas in Lancashire. We are also trying to obtain juvenile-post-juvenile ratios in migrant flocks. There is some evidence that some of the earlier influxes consist mainly of post-juveniles, which would suggest that some of the influxes could be accounted for from an age, not geographical, basis.

CURLEW SANDPIPER (*Calidris testacea*).

This species breeds in Siberia and the autumn passage through Britain closely follows that of the Little Stint. Post-juvenile Curlew Sandpipers are regular in small numbers, arriving in the second half of July. These often have complete red plumage on arrival and may stay until they have moulted into grey winter plumage before leaving. In recent years birds have spent up to two months in the study area during which time they have moulted from summer to winter plumage.

The larger influxes of juveniles occur in September and October, the size and time of the influx being dependent on the weather conditions. With a strong easterly airstream large numbers may occur with Little Stints (see table 2 and figure 2).

RUFF (*Philomachus pugnax*).

The Ruff is an extremely abundant species in the Inner Ribble Marshes (Greenhalgh, 1967), though not breeding. First passage migrants appear in late June or early July. These early influxes up to August usually consist of adult males; the main arrivals of females and juveniles appear throughout August and September. In past years numbers have built up to peaks in September and October which subsequently decreased to only a few wintering birds. In recent years wintering birds have been more numerous. The last year of this study, 1967, saw more Ruffs than any other previous autumn (figure 2), the peak reaching 120. At least 107 wintered.

LESS REGULAR VISITORS

Two types of wader come under this category. Firstly there are those which are common and regular elsewhere on the Lancashire coast, even on the Ribble estuary a mile or so away. Birds such as the Knot (*Calidris canutus*) come under this type. On the open shore and estuary Knot are common and abundant from autumn to spring

and a few straggle into the study area. Other stragglers from the open shore are Grey Plover (*Squatarola squatarola*), Turnstone (*Arenaria interpres*), Black and Bar-tailed Godwits (*Limosa lapponica* and *limosa*), and Sanderling (*Crocethia alba*). These may be recorded when driven by the tide or attracted by the feeding areas or feeding birds. Most records are from August to October.

Possibly the Whimbrel (*Numenius phaeopus*) should also be included under this heading. Although being regular, often in quite large numbers, in spring, only odd ones appear in autumn between July and September. The Jack Snipe (*Lymnocyrtus minimus*) occurs irregularly in the area in small numbers, the first arriving in November or December depending on weather conditions.

Finally, the list of uncommon autumn migrants and vagrants to the Inner Ribble Marshes is long. Since 1960 there have been a Dotterel (*Eudromias morinellus*) in September 1965, Temminck's Stint (*Calidris temminckii*) in October 1963 and 1964, and Little Ringed Plover (*Charadrius dubius*) in every year since 1963, in July and August. In October 1961 there was a Grey Phalarope (*Phalaropus fulicarius*). These are of Palaearctic origin.

Of Nearctic origin since 1960 there have been a Buff-breasted Sandpiper (*Tryngites subruficollis*) in 1960, Baird's Sandpiper (*Calidris bairdii*) in 1963, White-rumped Sandpipers (*Calidris fuscicollis*) in 1963 and two in 1964, Dowitcher (*Limnodromus* sp.) in 1963, Lesser Yellowlegs (*Tringa flavipes*) in 1965 and a probable Least Sandpiper (*Calidris minutilla*) in 1967. These have occurred between August and early November and have always been associated with a strong westerly airstream across the Atlantic. Usually they have coincided with the arrival of American birds elsewhere in Britain.

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FIELD NOTE

Aquatic Warbler at Whitby — First County Record

Two schoolboys, Richard Helm and Roy Barton picked up a small bird, still alive, from the verge of Airy Hill, Whitby. They took it to Bryan Fewster, who realised that the bird was an unusual one and identified it as an Aquatic Warbler (*Acrocephalus paludicola*). This was on 6th November, 1967, an unexpected date for the species to be added to the County list. The bird died the following day and was later preserved by Mr. Fewster by injections of formalin. In this condition it was seen by the County Records and others and the record has been accepted by the British Birds Rarities Committee.

In the hand the bird shows clearly the dark and light striped appearance of the plumage which gives it the colloquial name of the tiger, used at Cap Gris Nez by bird watchers who know the species well. Certainly the centre of the crown and the supercillium and lores are of a clear golden buff contrasting with the black, slightly streaked sides of the head above the eye stripe. The body has a much more streaked and warmer colouring than has the Sedge Warbler (*Acrocephalus schoenobaenus*) with which it is most likely to be confused. Detailed notes of the plumage and measurements of the bird have been prepared by J. R. Mather and the specimen has been returned to the Pannett Museum, Whitby.

A. J. WALLIS

A LIST OF BOTANICAL AND ZOOLOGICAL COLLECTIONS AT THE YORKSHIRE MUSEUM, YORK

C. SIMMS

This is a synopsis of major research, reference and display collections at the Yorkshire Museum, including accessions up to the end of 1966. Although the general scope of the collections is Recent British, there is some foreign (Palearctic) material amongst the arthropods and vertebrates, and some Oceanic representation in the molluscs. Additional and replacement material, particularly Yorkshire specimens, is sought. Some of the evident gaps are being filled by selective collecting.

Collections are listed in chronological order of accession and the dates of accession are given after those of the collector or the donor. Some discrepancies between accounts of collections, and even dates of collectors, have been revealed and investigated; there are probably others and the author looks to the readership of the *Naturalist* to assist in the preparation of more accurate data as well as to point out errors and to offer additional information where relevant. The list as it stands is entirely and solely his responsibility. The author gratefully acknowledges the help of the following: J. Armitage, A. Brindle, Sir C. Richmond Brown, G. B. Corbet, Miss E. Crackles, J. H. Elliot, J. H. Fidler, J. H. Flint, Mrs. M. Fogan, W. K. Ford, E. F. Greenwood, Miss M. M. Hartley, Mrs. L. M. Irvine, Mrs. N. F. MacMillan, Miss C. M. Rob, W. A. Sledge, C. J. Smith, D. A. E. Spalding, R. T. Thompson, R. Wagstaffe, P. E. S. Whalley, A. C. Wheeler, K. Williamson, and G. F. Willmot have assisted in the compilation at various stages, whilst the York Reference Librarian (M. Smith) and his staff have been most helpful throughout. J. H. Fidler, Miss C. M. Rob, W. A. Sledge, R. Wagstaffe, and G. F. Willmot have read numerous drafts prepared by Miss M. Tindill.

Viewing of the reference and research collections must be by appointment. The nature of much of the material precludes the practicability of a comprehensive loan service but some material may occasionally be sent out where circumstances allow. There is a useful, but by no means consistently up-to-date, reference library housed with the zoological collections in the Natural History Reference Room; this includes long runs of some periodicals, and a loan service is in operation. A bibliography of the natural history department at the museum, and of published accounts of collections, obituaries of collectors and other workers, is in process of formation.

Between 1894 and 1906 H. J. Wilkinson catalogued the British Phanerogams in the herbaria of his day, adding parts of his own collection at the same time. His catalogue (4) refers to one of the major herbaria, known then as the 'Herbarium of the Yorkshire Philosophical Society'. (The museum was the property of this Society between 1822 and 1961, when it became a department of York Corporation.) Wilkinson's catalogue is still very useful, although it is not free from copying and other errors. The other major herbarium of phanerogams, that of A. Wilson, had been critically reviewed and completely card-indexed by Miss M. M. Hartley before Wilson's manuscript catalogue was discovered. There are thus two independent and valuable guides to this herbarium. The cryptogamic herbaria are not yet catalogued.

The Zoological collections have few useful catalogues at present. The large collections of Coleoptera received between 1940 and 1945 were being amalgamated by J. H. Fidler and W. D. Hincks during 1944 (2, 3) and 1945; but this work had to be left unfinished. The T. H. Allis Lepidoptera and A. C. Braham Arachnida have useful manuscript catalogues, but those for a few other collections, including the early catalogue of the Backhouse birdskins (1) can be related to collections today only with difficulty. The birds' eggs are being gradually re-organised by Miss S. Crompton and the birdskins are being catalogued and card-indexed; L. Cornwallis has been responsible for the Orders Colymbiformes through Anseriformes and I have just completed the Falconiformes.

BRITISH CRYPTOGAMIC HERBARIA

Mrs. A. W. Legard (fl. 1875) 1890, 2,000 Marine Algae.
W. Bean sen. (1817-64) 1923, 5,000 Marine Algae and Ferns.
G. Webster (1851-1924) 1932, 4,000 Bryophytes, including some foreign material.
H. Stansfield (-1932) 1933, 2,000 Bryophytes.
H. Sowden (1870-1936) 1941, 2,000 Bryophytes of which only about 800 remain.
W. Bellerby (1852-1936), 5,000 Bryophytes.
W. G. Bramley 1942-5, 1,200 Fungi.
A. Wilson (1862-1949) 1946, 5,000 Bryophytes and Lichens.

BRITISH PHANEROGAMIC HERBARIA

The Rev. J. Dalton sen. (1764-1843) 1827, 1887, 2,000. Major contributors include the Rev. W. Bingley, W. Borrer, W. Brunton, Sir T. G. Cullum, G. Don, J. Donn, The Rev. S. Goodenough, Sir T. Gage, R. K. Greville, Sir W. J. Hooker, E. Robson, The Rev. R. Relhan, Sir J. E. Smith, W. Sole, R. Teesdale and D. Turner.

W. Middleton (-1842) 1827, 1,500. Entirely the work of Middleton.
G. Munby (1813-76) 1833. A small number of sheets remain from a once extensive herbarium.

S. Hailstone, (1767 or 1768-1851) 1859, 1887, 2,000. Major contributors include C. C. Babington, J. Backhouse (1794-1869), J. Backhouse (1825-90), S. Bromfield, W. Brunton, M. Birkbeck, G. Fitt, G. S. Gibson, J. Hailstone, 'Hustler', J. S. Howson, The Rev. J. E. Leefe, J. T. Mackay, E. Robson, 'Miss Stovin', J. D. Salmon, R. Spruce, J. Tatham, H. C. Watson, J. Ward, and J. B. Wood.

H. J. Wilkinson (1859-1934) 1892-1932, 2,000. Major contributors include H. Baines, B. Baker, J. Dalton jun., E. H. Farr, H. Fisher, the Rev. W. Gray, H. Ibbotson, R. A. Phillips, J. F. Robinson, R. Spruce, A. Templeman, F. H. Weekes and W. Whitwell.

N.B. In his *Catalogue*, H. J. Wilkinson (4) refers to other smaller herbaria, which can be interpreted as contributory to his own although he evidently regarded them as still discrete. These represent: H. Baines (with material from R. Spruce), B. Baker (S. C. Baker, W. P. Bain, J. Clapperton and J. S. Henslow), A. Bennett (H. Gluck and T. Rogers), W. Brunton, J. Dalton jun., J. W. Donaldson, J. Mennell, O. A. Moore (L. Grindon), H. M. Platnauer, J. F. Robinson, A. Templeman, 'Walker' (R. K. Greville, R. Spruce and J. Tatham), and F. H. Weekes.

A. W. Walker (-) 1892-3. Major contributors include H. Baines, R. Spruce, J. Backhouse (1794-1869) and H. Ibbotson.

E. C. Wallace 1944. Yorkshire plants, chiefly *Carex* and *Potamogeton*.

A. Wilson (1862-1949) 1946, 7,000. Major contributors include L. Arsène, C. Bailey, W. Biddiscombe, S. H. Bickham, G. C. Brown, J. Cryer, A. A. Dallman, G. C. Druce, J. B. Foggitt, J. N. Frankland, J. Groves, P. M. Hall, A. R. Horwood, A. Ley, J. E. Little, J. E. Lousley, D. Lumb, J. C. Melville, C. E. Moss, C. E. Palmer, W. H. Pearsall, J. H. Riddelsdell, F. Robinson, I. M. Cooper, W. A. Schoolbred, W. A. Sledge, R. L. Smith, J. H. A. Stewart, W. G. Travis, C. C. Vigurs, A. E. Wade, C. Waterfall, J. A. Wheldon, J. W. White and H. Wilson.

ADDITIONAL MATERIAL

Post-war additions to the herbaria have been made by a small number of workers and principally Miss C. M. Rob and R. Wagstaffe.

TRANSFERRED TO THE BRITISH MUSEUM (NAT. HIST.) 1952.

S. Hailstone (1767 or 1768-1851) 1859. British Algae and Foreign Ferns.

T. Sampson (-1897) 1894. 3,000 Chinese plants.

R. Spruce (1817-93) 3,000 Pyrenean plants.

'Walker' (-) 500 Greek Plants and

G. Webster (1851-1824) 700 packets Foreign Hepatics.

MISSING CRYPTOGAMIC HERBARIA

H. Baines (1793-1878) Mosses 1828; 'J. Dalton' 1842; The Rev. F. O. Morris (1810-93) Algae and Mosses 1885; W. H. Pearson (1849-1923) Mosses 1898; H. Y. Whytehead (fl. 1875) Ferns 1937.

MISSING PHANEROGAMIC HERBARIA

S. Stapylton (fl. 1820-30) North American 1828 and 'Herbarium Darmstedtae' 1830; W. Cattley (-1832) Russian 1831; The Rev. W. Hincks (1794-1871) 1839; The Rev. F. O. Morris (1810-93) 1843; 'J. Clarke' North American 1853; the Rev. W. L. W. Eyre (1841-1914) *Rubi* 1901; 'Miss Walker' Egyptian 1912; R. Wagstaffe 1942.

MISSING HERBARIUM

The Rev. W. Scoresby (1789-1857) Greenland 1827.

SEED AND FRUIT, DRIED COLLECTION. Sorted and listed by Miss M. M. Hartley, 1967.

Major contributors W. G. Bramley; A. A. Dallman (probably 1883-1962); Mrs. K. G. Payne and Miss C. M. Rob.

BRITISH AND FOREIGN MOLLUSCA: Cabinet collections of shells.

There are many specimens from the following collectors, in four cabinets, which were being incorporated by A. Smith before his death. These collections need critical examination by conchologists before they can be arranged, listed and catalogued.

J. Backhouse (1861 or 1862-1945); W. Bean sen. (1817-64); H. Dobson (fl. 1905-28) 1960; The Rev. W. C. Hey (1853-1909); W. Reed (1810-91 or 1892) 1889; H. Sowden (1870-1936) 1921; and possibly others including 'W. Danby', 'Gilbertson', 'The Earl of Tyrconnel', J. Hanley and J. A. Hargreaves.

BRITISH AND FOREIGN CRUSTACEA: Spirit Collection.

W. E. Collinge (1867-1947) c. 100, chiefly Isopoda, 1921-40. In poor condition.

BRITISH AND PALAEARCTIC INSECTA: Cabinet collections and a little recent spirit material.

The Rev. G. T. Rudd (fl. 1817-50) 1850. 2,000. Largely British Coleoptera and Hymenoptera, the remnant of a very large collection. Includes some Haworth material. Recently re-discovered and in poor condition.

T. H. Allis (Thos. Allis, jun.) (1817-70) 1870. 20,000 British Macro- and Micro-Lepidoptera with much Haworth material and several Type-specimens.

The Rev. W. C. Hey (1853-1909) 1867, 1891. 6,000 British Coleoptera. Material from 'Bates', W. Birch, J. C. Dale, J. M. Douglas, C. C. Dupré, S. Hey, W. Hey, 'Ledbetter', J. A. Power, J. C. Rye, 'Sharman' and T. Wilkinson.

W. H. St. Quintin (1851-1933) 1925-32. 15,000 Palaearctic Macro-Lepidoptera, many bred.

The Rev. W. T. Travis (1851-1924 or 1925) 1925. 6,000 Palaearctic Macro-Lepidoptera, partly merged with St. Quintin.

E. W. Aubrook 1941. 10,000 British Coleoptera, mainly Yorkshire, partly incorporated into the 'Central Reference Collection' (*vide* Hincks (2)).

J. R. Dibb and W. D. Hincks (1906-61) 1941. 2,000 British Coleoptera (Carabidae), mainly North of England.

G. B. Alexander (-) 1943. 800 British Coleoptera, Yorkshire.

H. W. Ellis (1869-1943) 1945. 100,000 British Insecta, mainly Coleoptera and Hemiptera but including some 3,000 Hymenoptera (Formicidae). Mainly South of England.

T. Stainforth (1882-1944) 1944. 10,000 British Insecta, mainly Yorkshire Coleoptera.

A. Smith (1887 or 1888-1957) 1944. 150 British Diptera, local.

M. G. L. Perkins (1899-1932) 1944. 9,000 British Coleoptera, mainly East Anglian.

R. Wagstaffe, 1944-9. 200 British Orthoptera, Odonata and Diptera: North of England.

H. Britten (1870-1954) 1945. 500 British Diptera, North of England.

K. Williamson, 1945. 500 Faroë Diptera, un-named.

P. H. Grimshaw (1869-1939) 1945. 500 British Diptera, North of England.

J. H. Elliott, 1946-66. 1,000 British Hymenoptera, Hemiptera and Diptera; un-named.

H. Dobson (fl. 1905-28) 1960. 5,000 British Macro-Lepidoptera, York district.

Mrs. B. Kendall, 1966. 300 British Insecta, various Orders; Cleveland district of Yorkshire.

BRITISH AND PALAEARCTIC ARACHNIDA: Spirit collections.

F. Dixon (1871-1951) 1946. 500 British Spiders in very poor condition, local.

K. Williamson, 1946. 500 Faroë Spiders and Harvestmen, not named.

A. C. Braham, 1966. 600 British Spiders including some long series, mainly Yorkshire.

PALAEARCTIC AMPHIBIA AND REPTILIA: Spirit and skin collection.

C. Simms, 1965, 250, mainly British and Mediterranean Basin.

PALAEARCTIC AVES: Cabinet and mounted skin collections, eggs and osteological preparations.

T. Allis sen. (1788-1875) 1831-71 c. 100 Skeletal preparations of British and Foreign birds.

W. H. R. Read (1806 or 1808-86) 1845-? A few mounted British birds survive from a once extensive collection.

A. Strickland (probably 1784-1863) 1866. Several mounted British birds survive from a large and important Yorkshire collection.

W. Reed (1810-91 or 92) 1880. British and Foreign osteological preparations.

J. Backhouse, (1861 or 62-1945) 1902. 4,000 British and Palaearctic study skins. Much material from C. R. Bree and W. Eagle Clark.

O. Grabham (1865-1939) 1905-6. 200 British skins and eggs.

A. W. Linfoot (-1931) 1922-? 200 British mounted specimens and skins, chiefly local.

P. M. Stewart (1872-1962) 1922. 100 Mounted British Birds.

R. Wagstaffe, 1941-8. Several hundred skins including material from W. H. Barrow, Sir C. Richmond Brown, W. J. Clarke, A. Hazelwood and A. Gordon.

G. Howard (1886-1952) 1942. 3,000 British eggs, Partly the work of E. G. Potter.

E. M. Rutter (fl. 1910-48) 1942. 2,000 British eggs, local.

W. A. Cooper (1880 or 81-1943) 1944. 3,000 British eggs, mainly North Yorkshire.

N. à. Botni, 1946 c. 100 Faroë bird skins.

BRITISH MAMMALIA

T. Allis sen. (1788-1875) 1874. A few mounted skeletons remain from a notable collection.

O. Grabham (1865-1939) 1905. 150 British study skins.

ZOOLOGICAL COLLECTIONS WITHOUT DATA

G. C. Dennis (1848-97) 1898. 8,000 British Macro-Lepidoptera.

R. Cook (probably 1806-82) 6,000 British Macro-Lepidoptera.

B. Stewart (-) 1944. c. 1920. British Coleoptera.

MISSING ZOOLOGICAL COLLECTIONS

MOLLUSCA: T. W. Flower, Canadian 1846; T. Clarke, N. American; A. Crawford, Pacific 1849, 1851, 1855; The Rev. T. Barnham, Adeni 1886.

CRUSTACEA: S. Hailstone, (fl. 1835-40) 1845.

INSECTA: 'Miss Atkinson' 1823; T. Backhouse 1823-5 and 1832; P. W. Watson 1825; The Rev. J. Dalton jun., 1827; S. Stapylton, North American 1823; J. C. Latrobe, South African 1829; H. Baines, Australian 1829; T. Meynell jun., British 1830, foreign 1836 and 7; The Rev. F. O. Morris 1836, 1842, 1863, 1866, 1869 and 1884; W. C. Hewitson, foreign 1855.

AMPHIBIA and REPTILIA: T. Allis sen., 1840; O. A. Moore 1862.

AVES: L. Edmonstone, Arctic skins 1827 and 1834; 'T. Allis', Foreign skins 1834; Capt. Spencer, Indian skins 1838; The Rev. Archd. Corbett, Indian 1839; The Rev. F. O. Morris, British eggs 1842-3; J. Gould, Australian skins 1844; 'T. Meynell jun.,' 'eggs' 1844-5; B. Thompson, New Guinea skins 1889; W. Dumurgue, Indian skins 1898.

REFERENCES

- (1) Backhouse, J. 1900-2. Preliminary Catalogue of the British Bird Collections in the possession of the Yorkshire Philosophical Society. *Y.P.S. Annual Reports 1899* (1900) to 1901 (1902).
- (2) Hincks, W. D. 1943. A central Reference Collection of Yorkshire Insects. *Naturalist*, 1943, pp. 55-6.
- (3) Hincks, W. D. 1944. Entomological Work in the North. *North Western Naturalist*, Vol. xix, pp. 61-2.
- (4) Wilkinson, H. J. 1895-1907. Catalogue of the British Plants in the Herbarium of the Yorkshire Philosophical Society. *Y.P.S. Annual Reports 1894* (1895) to 1906 (1907).

ALGAE OF THE RIVER WEAR 1. DIATOMS

A. J. PEABODY* AND B. A. WHITTON

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The algal flora of British rivers has seldom been studied intensively, and the only fast flowing one for which there is a comprehensive account is the R. Tees. Butcher, in Butcher, Longwell and Pentelov (1937), concluded that diatoms accounted for 70% of the total micro-organisms in the R. Tees, and he dealt with this phylum in some detail. Recently the diatoms of the R. Tees have been surveyed again by Whitton and Dalpra (in press). They concluded that of 148 diatoms listed, there were only five detectable changes in abundance between the two surveys, none of them involving dominant species. As the floristic composition of the R. Tees appears to have changed little in over 30 years, it was therefore decided to see how great is the difference between this river and the river immediately to its north, the R. Wear. Since Butcher's survey a considerable literature has been published on diatoms from rivers in other parts of Europe and North America, but little on attached diatoms of British rivers. The following introductory account of the epilithic and epiphytic diatoms of the R. Wear is presented for comparison with the previous literature, and as part of a general survey of this river.

The data for each species is given under the following headings:

- (i) Morphological and taxonomic comments.
- (ii) Records made as part of an intensive survey carried out on 3rd September, 1966 (3.IX.66). Diatom samples were taken from each of 19 sites. At each site material was collected from a range of habitats chosen subjectively to give a representative picture of the epilithic and epiphytic diatoms present. The 19 sites are referred to in the text simply by their distance from the start of the river, and are as follows:

km 0.0	Wearhead	km 35.2	weir above Witton Bridge
km 1.0	West Blackdene	km 43.2	Newton Cap Bridge
km 2.7	Broken Way Ford	km 44.2	Jock's Bridge
km 4.4	Bridge End	km 54.2	Page Bank
km 9.2	Cambo Keels	km 65.6	downstream of Shincliffe Bridge
km 10.5	above Rookhope Burn	km 70.6	Kepier
km 13.7	Briggen Winch	km 80.6	Cocken Bridge
km 16.2	Shittlehope Burn	km 92.2	Lamb Bridge
km 24.3	Wolsingham Bridge	km 100.9	S. Hylton Ferry
km 26.3	Scotch Isle		

600 cells were counted for each site and these are referred to as the 'total diatom population' for that site. Diatoms not recorded under this heading were not found on this date.

- (iii) Specific records for other dates (included only if of particular interest).
- (iv) Tentative generalizations, where possible.
- (v) Interesting comparisons with the literature or other comments.

CENTRALES

Melosira nummuloides (Dillw.) Ag. (i) Chains of cells 12–20 μ diameter (ii) Furthest upstream record at km 80.6; formed the majority of cells at km 100.9 (FIG. 1) (iii) Abundant on 26.VI.66 at Glasshouse Hill (km 104.2). Not recorded from R. Tees, although Butcher's lowest station was in the tidal reach.

M. varians Ag. (i) 8–20 μ diameter (ii) Furthest upstream record at km 16.2, in very low numbers; gradually increased in relative abundance to maximum at km 70.6 (iv) *M. varians* appears largely to be replaced by *M. nummuloides* in the estuarine region.

Skeletonema costatum (Grev.) Cleve (iii) A few cells on 27.VI.66 at Glasshouse Hill (km 104.2).

Thalassiosira fluviatilis Hust. (i) 18–20 μ diameter (ii) A few cells seen at km 65.6, km 70.6, km 80.6.

Cyclotella meneghiniana Kütz. (i) 9–18 μ diameter; the smallest cells found are smaller than the lower limit of 10 μ given by Hustedt (1930b). *C. kütziana* Thwaites was not recorded from R. Wear (ii) Found in the lower part of the river, at and below km 65.6, forming 2–4% of the population.

Actinopterychus splendens (Shadb.) Ralfs (iii) On 27.VI.66 at Glasshouse Hill (km 104.2) on *Pilayella*.

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PENNALES

- Tabellaria fenestrata* (Lyng.) Kütz. (i) 30–140 $\mu \times$ 3–9 μ (ii) five cells seen in samples from km 0.0.
- T. flocculosa* (Roth) Kütz. (i) 16–25 μ long; 6–10 μ wide in the centre and 3.5–4.0 μ at the poles (iv) Present throughout almost all the river, occurring as single cells, or in small numbers.
- Grammatophora serpentina* (Ralfs) Ehr. (i) 25–180 $\mu \times$ 12–18 μ (ii) one cell noted at km 80.6 (iii) Common at Glasshouse Hill (km 104.2) on *Pilayella* on 27.VI.66.
- Licmophora ehrenbergii* (Kütz.) Grun. (iii) At Glasshouse Hill (km 104.2) on *Pilayella* on 27.VI.66.
- Meridion circulare* (Grev.) Ag. (i) 16–39 $\mu \times$ 3–6 μ ; somewhat narrower than the width range (4–8 μ) given by Hustedt (1930b). The var. *constricta* (Ralfs) v. Heurck also present (ii) Formed 5% diatom population at km 0.0, decreased in relative abundance on passing downstream; solitary cells only found in the tidal reaches (iv) Possibly relatively more abundant in early spring, at least in the more polluted waters (v) Described by van der Werff (1957) as an 'oligohalobe' and rheophilous. Fjordingstad (1964, 1965) places this species in his class of saproxenous organisms, i.e. those generally occurring in biotopes other than polluted ones, but which may also be found in the presence of moderate pollution.
- Diatoma vulgare* Bory (i) 20–50 $\mu \times$ 6–12 μ ; ribs 7–8/10 μ . No attempt made to separate this variable species into its named varieties; at one extreme the forms approach *D. elongatum* (Lyng.) Ag. (ii) Throughout the river, but most abundant at km 1.0, where formed 6% diatom population (iii) A frequent organism throughout the river at all times of year (v) Fjordingstad (1964, 1965) classed this species as saprophilous, but it does not show any such tendency in either the R. Wear or R. Tees. It is frequent in some unpolluted tributaries of R. Wear, e.g. Burnhope Burn.
- D. elongatum* (Lyng.) Ag. (ii) Two cells seen at km 43.2 and km 92.2.
- D. hiemale* (Lyng.) Heiberg (i) As var. *mesodon* (Ehr.) Grun.: 12–20 μ long and 6–12 μ wide (ii) Occurred sporadically, more common above km 35.2.
- Opephora martyi* Heribaud (i) If the heteropolarity is not well pronounced some confusion may arise between this species and *Fragilaria* spp. (iii) At Glasshouse Hill on *Pilayella* (km 104.2) on 27.VI.66.
- Ceratoneis arcus* Kütz. (i) shape very variable; includes var. *amphioxys* (Rabh.) Brun. 2.5% of the diatom population at km 1.0 (iv) Frequent throughout the year though always more abundant in the upper reaches.
- Fragilaria intermedia* Grun. (i) 24–34 $\mu \times$ 2.5–5.0 μ ; striae 11–12/10 μ . This species is not readily determined from the girdle aspect, a problem with many *Fragilaria* spp. Petersen (1938) in fact considered that *F. intermedia* is identical with *Synedra vaucheriae*, and united the two under *F. vaucheriae* (Kütz.) Petersen (iv) One of the more important diatoms of the river, though more abundant in the upper reaches.
- F. construens* (Ehr.) Grun. (i) As fo. *binodis* (Ehr.) Grun. (ii) A few cells seen at km 70.6 and km 80.6.
- F. pinnata* Ehr. (i) As var. *lancettula* (Schumann) Hust. (ii) A few cells seen at km 70.6, km 80.6 and km 100.9.
- F. brevistriata* Grun. (iii) Seen only once at Lumley Bridge (km 88.1) in September 1965.
- Asterionella formosa* Hass. (ii) One cell seen at km 0.0 (which is however below Burnhope Reservoir).
- Synedra ulna* (Nitzsch) Ehr. (i) A range of forms occur; perhaps the most clearly delimited is var. *oxyrhynchus* (Kütz.) v. Heurck (ii) Present at almost all stations, though more common in the upstream ones; 2% diatom population at km 0.0 and km 2.7.
- S. acus* Kütz. (ii) Single cells seen at km 1.0 and km 4.4.
- S. rumpens* Kütz. (*sensu lato*) (i) This taxon is used here as a receptacle for the smaller *Synedra* species, where the shapes of the frustule and of the central area are both variable. Cells approaching typical *S. minuscula* Grun. and *S. amphicephala* Kütz. were met. An objective separation into the various species could probably be obtained only by numerical methods (ii) Occurred throughout the river, but more abundant in the uppermost three kilometres (iv) The previous statement is probably applicable throughout the year.

- S. affinis* Kütz. (ii) Occurred at various sites in very low numbers; more common below km 43.2.
- S. pulchella* Kütz. (i) Both type and var. *lanceolata* O'Meara present.
- S. vaucheriae* Kütz. See *F. intermedia* above.
- Eunotia bigibba* Kütz. (i) As var. *pumila* Grun. (iii) Noted once, at Durham (km 67.6) on 11.X.65.
- E. exigua* (Bréb.) Rabh. (ii) At various sites, but most frequent from km 9.2 to km 24.3.
- E. lunaris* (Ehr.) Grun. (i) As var. *subarcuata* (Näg.) Grun. Typical cell: $32\ \mu \times 4\ \mu$; striae 16/10 μ . (ii) A few cells noted from widely separated sites.
- E. pectinalis* (Kütz.) Rabh. (i) Only cell: var. *minor* (Kütz.) Rabh. fo. *impressa* (Ehr.) Hust.: $52 \times 5\ \mu$, striae 15/10 μ (ii) km 16.2.
- E. polydentula* Brun. (i) As var. *perpusilla* Grun. (iii) A few cells seen at Lamb Bridge (km 92.2) on 23.III.66.
- E. tenella* (Grun.) Hust. (ii) Single cells seen at km 2.7 and at km 10.5 (above the entry of Rookhope Burn).
- E. trinacria* Krasske (ii) One cell at km 43.2.
- Cocconeis pediculus* Ehr. (i) 19–31 μ long, 10–23 μ wide (iv) An abundant epiphyte in the warmer months, in particular often smothering *Cladophora glomerata* (v) Due to the rapidity with which this organism can grow and the density of the covering it can form on *Cladophora* it seems likely that this species will prove one of the most ecologically important in the river. Although occasional cells of *Cocconeis pediculus* are found in other habitats, this is more restricted to the epiphytic habitat than any other species.
- C. placentula* Ehr. (i) 16–22 (–35) μ long, 8–11 (–20) μ wide (iv) Usually associated with filamentous algae other than *Cladophora*.
- C. diminuta* Pantocsek (i) The one valve noted was $12 \times 8\ \mu$ and had striae 10/10 μ on the rapeless valve (iii) Valve found at Durham (km 67.6) on 17.IX.65.
- Achnanthes minutissima* Kütz. (i) 8–20 $\mu \times 4$ –6 μ ; some forms approach var. *cryptocephala* Grun. (ii) Throughout the river, and an important constituent of the diatom population from km 0.0 to km 35.2, reaching 73% diatom population at km 4.4.
- A. affinis* Grun. (ii) One cell at km 0.0.
- A. lanceolata* Bréb. (i) 8–20 $\mu \times 4$ –6 μ . The fo. *ventricosa* Hust. also occurs, a typical cell being $35 \times 12\ \mu$, striae 13/10 μ (iv) The type occurs in small amounts throughout almost all the river; the fo. *ventricosa* is less common than the type.
- A. pyrenaica* Hust. (i) 11–12 $\mu \times 4$ –5 μ ; striae 23–26/10 μ . The alga agrees with the description by Hustedt (1939), except he recorded the striae as 21–25/10 μ (ii) Fairly common between km 4.4 and km 16.2; less common than elsewhere (v) This is apparently the first published record of this organism in the British Isles. Judging by recent European literature this may be a relatively common species which is usually included elsewhere.
- A. brevipes* Ag. (i) var. *intermedia* (Kütz.) Cleve. Typical cell from km 100.9: $32 \times 13\ \mu$; striae 10/10 μ . (ii) One cell at km 80.6, but quite common at km 100.9.
- Rhoicosphenia curvata* (Kütz.) Grun. (ii) A single cell at km 0.0, but otherwise not noted above km 43.2; most abundant at km 65.6 (iv) A frequent epiphyte, especially in the middle reaches of the river and on *Cladophora*. It is perhaps especially abundant in spring before dense populations of *Cocconeis pediculus* have developed.
- Amphipleura pellucida* Kütz. (ii) One cell noted at each of km 4.4, km 13.7, km 70.6.
- A. rutilans* (Trentepohl) Cleve (ii) Present at km 80.6 and km 100.9.
- Frustulia vulgaris* Thwaites (i) Typical cell: 47 – $55\ \mu \times 9$ – $10\ \mu$. Cells from R. Wear are generally smaller than described by Hustedt (1930a; 1930b) (ii) At various stations from km 0.0 to km 100.9.
- Gyrosigma acuminatum* (Kütz.) Rabh. (i) 150–175 $\mu \times 22\ \mu$ (ii) A few cells noted from km 80.6 and km 100.9.
- Pleurosigma angulatum* (Quekett) W. Sm. (iii) A few cells noted on *Pilayella* at Glasshouse Hill (km 104.2) on 27.VI.66.
- Caloneis alpestris* (Grun.) Cleve (ii) Seen only at km 0.0.
- C. amphibaena* (Bory) Cleve (ii) A few cells noted at km 70.6 and km 92.2.

C. bacillum (Grun.) Mereschowsky (i) This species is easily confused with *C. silicula* var. *truncatula*, which is equally common, and possibly also with certain *Naricula* spp. if the parallel longitudinal striae are not seen clearly (iv) Widespread, but always present in only low numbers.

C. silicula (Ehr.) Cleve (i) As var. *truncatula* Grun. The striae are faint and at least $20/10\ \mu$ (ii) At sites above and including km 26.3.

Neidium iridis (Ehr.) Cleve (ii) One cell at km 70.6.

N. dubium (Ehr.) Cleve (ii) One cell at km 70.6.

Diploneis didyma (Ehr.) Cleve (i) Typical cell: $67.5 \times 22.5\ \mu$, ribs $10/10\ \mu$ (iii) On *Pilayella*, Glasshouse Hill (km 104.2) on 27.VI.66.

D. ovalis (Hilse) Cleve (i) $25-35\ \mu \times 12-14\ \mu$ (ii) In small amounts at four widely spaced stations.

Stauroneis smithii Grun. (ii) One cell at km 2.7.

Anomoeoneis exilis (Kütz.) Cleve (i) $20-21\ \mu \times 5\ \mu$ (ii) As with: (iv) Occurs sporadically,

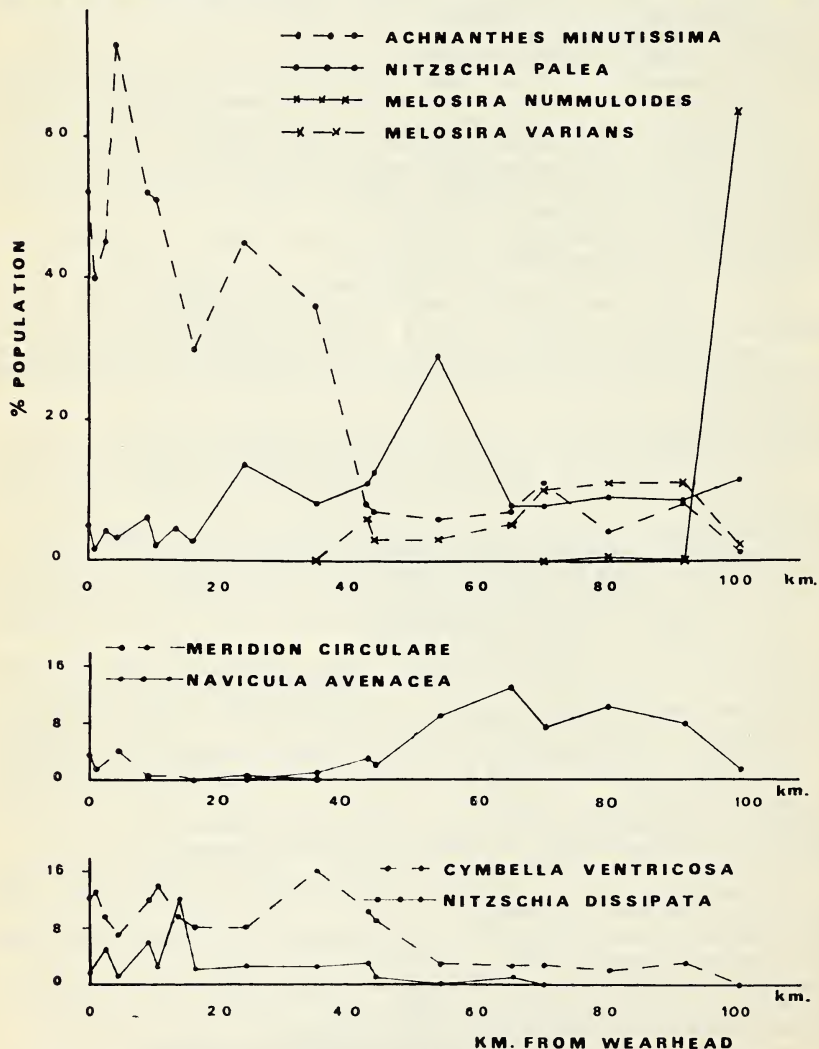


FIG. 1. Distribution of eight diatom species in the River Wear on 3.IX.66.

either singly or in small amounts.

- A. zellensis* (Grun.) Cleve (i) Occurs as fo. *difficilis* (Grun.) Hust.; $24 \times 4 \mu$, striae indistinct (ii) Single cells seen at km 4.5 and km 9.2
- Navicula accomoda* Hust. (ii) One cell at km 24.3.
- N. anglica* Ralfs (i) $26 \times 10 \mu$, striae 11/10 μ (ii) Single cells at km 2.7 and 70.6.
- N. atomus* (Näg.) Grun. (ii) As with: (iv) Frequent occurrence, though only in small amounts.
- N. avenacea* Bréb. (i) Hustedt (1930a) included this as a variety of *N. viridula* Kütz. and many subsequent authors have followed him. However by the criteria widely used for the separation of species within *Navicula* there seems no justification for doing this (ii) See FIG. 1 (iv) Generally abundant, but less common in the upper reaches and also decreasing with increasing salinity.
- N. bryophila* Petersen (ii) A few cells seen at km 0.0.
- N. certa* Hust. (i) Single cell: $23 \times 5 \mu$, striae 12/10 μ ; rather smaller than the form described by Foged (1964) (ii) One cell seen at km 0.0.
- N. cincta* (Ehr.) Kütz. (i) As var. *heufleuri* Grun. $18 \times 4 \mu$, striae 16/10 μ . Smaller than those forms described by Hustedt (1930a), and Van der Werff & Huls (1955), and with closer striation than the 10/10 μ limit of Hustedt (1930a) (ii) A few cells seen at km 0.0, km 24.3 and km 70.6.
- N. contenta* Grun. (ii) A few cells seen at km 16.2 and km 44.2 (v) A very small cell, which in many surveys is probably overlooked or confused with certain forms of *Achnanthes minutissima*.
- N. cryptocephala* Kütz. (i) As var. *intermedia* Grun.: Typical cell: $35 \times 6 \mu$, striae 16/10 μ (ii) In low numbers at km 2.7, 13.7, 16.2, 43.2 (v) See *N. gregaria* below.
- N. cuspidata* Kütz. (iii) Seen once at Durham (km 67.6) on 11.x.65.
- N. gracilis* Ehr. (i) $38-50 \mu \times 7-9 \mu$; striae 11-12/10 μ (ii) Present at and below km 13.7 but more common below km 43.2, most abundant at km 80.6 and absent at km 100.9.
- N. graciloides* A. Mayer (ii) A few cells seen at km 0.0.
- N. gregaria* Donkin (i) $15-27 \mu \times 6-7 \mu$ (ii) Throughout the river, but infrequent in the upper reaches; most abundant at km 80.6 (v) It is easy to confuse this species with *N. cryptocephala* unless a mountant of high refractive index is used. A useful diagnostic feature is the distinct asymmetry of the central area in *N. gregaria*. Hustedt (1957) states that *N. gregaria* is the most common diatom species in the R. Weser, seldom missing in a single sample, and occurring in large numbers in many samples. This species has probably been included in *N. cryptocephala* in many previous surveys of river diatoms. It has been found in large amounts in many other samples, including several from the R. Tees and several Lancashire rivers.
- N. hungarica* Grun. (i) Occurs as var. *capitata* (Ehr.) Cleve (ii) A few cells seen between km 70.6 and km 100.9.
- N. integra* (W. Sm.) Ralfs (i) Typical cell: $38 \times 11 \mu$, striae 17-19 μ . Dimensions are rather larger than the forms described by Hustedt (1930a) (ii) A few cells seen at and between km 70.6 and km 100.9.
- N. lapidosa* Krasske (i) Typical cell: $17 \times 5.5 \mu$, striae at 22-24/10 μ as compared with 26/10 μ in Hustedt (1930a).
- N. menisculus* Schumann (i) $25-33 \mu \times 8.5-10 \mu$ striae 10-11 μ (ii) Occasional throughout the river, always in small amounts.
- N. minima* Grun. (i) As var. *atomoides* (Grun.) Cleve (ii) As with: (iv) Frequently recorded, but always in small numbers.
- N. minuscula* Grun. (ii) Single cells at km 2.7, km 26.3, km 43.2, km 80.6.
- N. muralis* Grun. (ii) Single cells at km 4.4 and km 65.6.
- N. mutica* Kütz. (i) As var. *cohnii* (Hilse) Grun. (ii) Single cells seen at km 80.6, km 92.2, km 100.9.
- N. pelliculosa* (Bréb.) Hilse (i) $8-10 \mu \times 4-5.5 \mu$ (ii) Throughout almost all the river, but most abundant at km 54.2, reaching 10% population.
- N. pupula* Kütz. (ii) One cell seen at km 24.3.
- N. pygmaea* Kütz. (ii) Occurred only at km 80.6 and below.
- N. schonfeldtii* Hust. (ii) A few cells seen at km 2.7 and km 16.2.
- N. subatomoides* Hust. (ii) A few cells seen at six of the stations between km 4.4 and km 100.9.
- N. subhamulata* Grun. (i) $15-19 \mu \times 6.5-7 \mu$; the striae always indistinct (ii) Seen only at and below km 26.3, most frequent at km 100.9.

- N. subocculata* Hust. (i) One cell only: $16 \times 6 \mu$, striae $16/10 \mu$ (iii) One cell seen at 1.IV.66 at Jack's Bridge (km 44.2).
- N. vitabunda* Hust. (ii) One cell seen at km 0.0 and a few at km 70.6.
- Pinnularia braunii* (Grun.) Cleve (i) Only cell: var. *amphicephala* (A. Mayer) Hust. $65 \times 9 \mu$ striae $11/10 \mu$ (iii) In August 1966 at the Rookhope Burn inflow (km 10.5).
- P. divergentissima* (Grun.) Cleve (ii) One cell seen at km 0.0.
- P. intermedia* Lagerstedt (i) $16 \times 5 \mu$; striae $10/10 \mu$ (ii) One cell seen at each of km 9.2 and km 13.7.
- P. interrupta* W. Sm. (i) One cell: $36 \times 8 \mu$, striae $13/10 \mu$ (ii) One cell seen at km 0.0.
- P. mesolepta* (Ehr.) W. Sm. (i) $45 \times 8 \mu$, striae $13/10 \mu$ (iii) Seen only in August 1966 at the Rookhope Burn inflow (km 10.5).
- P. microstauron* (Ehr.) Cleve (i) Only cell: $48 \times 11 \mu$, striae $11/10 \mu$ (ii) One cell seen at km 16.2.
- P. viridis* (Nitzsch) Ehr. (ii) Although only a few cells at km 2.7, km 4.4 and km 35.2, nevertheless the most frequent *Pinnularia*.
- P. wijkensis* Foged 1964 (i) One cell: $47 \times 6 \mu$, striae $12/10 \mu$ (ii) One cell seen at km 2.7 (iv) Probably the first British record. Before Foged's paper, such cells were possibly referred to *P. gibba* Ehr.
- Amphiprora paludosa* W. Sm. (i) $24 \times 10 \mu$, striae indistinct. Hustedt's (1930a) limits are $40\text{--}130 \mu \times 25\text{--}30 \mu$ (ii) At km 100.9.
- Amphora ovalis* Kütz. (i) $12 \times 6 \mu$; the small variety *pediculus* Kütz. also present (iv) Frequently present, though usually in low numbers; the var. *pediculus* may occur together with the type.
- A. veneta* Kütz. (iii) On 27.VI.66 at Glasshouse Hill (km 104.2) on *Pilayella*.
- A. lineolatae* Ehr. (iii) On 27.VI.66 at Glasshouse Hill (km 104.2) on *Pilayella*.
- Cymbella affinis* Kütz. (ii) One cell seen at km 0.0.
- C. aspera* (Ehr.) Cleve (i) Typical cell: $58 \times 17 \mu$, striae $8/10 \mu$, punctae $13/10 \mu$. The R. Wear form is smaller than the forms described by Hustedt (1930a).
- C. angustata* (W. Sm.) Cleve (iii) One cell seen in September 1965 at Lumley Bridge (km 87.8).
- C. cesati* (Rabh.) Grun. (i) $35\text{--}48 \mu \times 5\text{--}7 \mu$, striae $18\text{--}20/10 \mu$ (ii) A few cells seen at km 2.7, km 16.2 and km 24.3.
- C. cymbiformis* (Ag.) v. Heurck (i) $30\text{--}33 \mu \times 8\text{--}10 \mu$, striae $8\text{--}10/10 \mu$ (ii) A few cells seen at km 24.3 and km 43.2.
- C. delicatula* Kütz. (i) $22\text{--}32 \mu \times 6\text{--}7 \mu$, striae $17\text{--}19/10 \mu$. The R. Wear cells are generally larger than the limits given by Hustedt (1930a) (ii) Occurs throughout almost all the river, but most common in the uppermost stations.
- C. helvetica* Kütz. (i) Typical cell: $48 \times 11 \mu$; striae $15/10 \mu$ at the ends, $12/10 \mu$ on the ventral side.
- C. leptoceros* (Ehr.) Grun. (i) $36\text{--}55 \times 8.5\text{--}14 \mu$, striae $9/10 \mu$ on the dorsal side, $10/10 \mu$ on the ventral side. Cells relatively broader than those described by Hustedt (1930a) (ii) At km 1.0 and km 2.7.
- C. microcephala* Grun. (i) $13\text{--}15 \times 3.5\text{--}4.5 \mu$ (iv) Frequently present in small numbers.
- C. naviculiformis* Auerswald (iii) One cell seen on 19.VIII.65 at Wearhead (km 0.0).
- C. parva* (W. Sm.) Cleve (i) Typical cell: $55 \times 14 \mu$; striae $9/10 \mu$ on the dorsal side, $10/10 \mu$ on the ventral side (ii) A few cells seen at each of km 1.0, km 13.7 and km 16.2.
- C. prostrata* (Berkeley) Cleve (i) $40\text{--}50 \mu \times 15\text{--}17 \mu$; striae $9\text{--}10/10 \mu$ (ii) One cell seen at each of six different stations at and below km 9.2.
- C. sinuata* Greg. (i) $9\text{--}17 \mu \times 4\text{--}6 \mu$; smaller than the forms described by Hustedt (1930a) (ii) Occurred at almost all stations, but most abundant at km 44.2.
- C. tumida* (Bréb.) v. Heurck (i) $50 \times 15 \mu$; striae $10/10 \mu$, punctae $16/10 \mu$ (ii) One cell seen at km 43.2.
- C. ventricosa* Kütz. (i) $16\text{--}28 \mu \times 5\text{--}18 \mu$; striae $12/10 \mu$ (ii) Throughout the river, but most common at km 35.2.
- Didymosphenia geminata* (Lyng.) M. Schmidt (i) $100/130 \mu \times 20\text{--}28 \mu$ (ii) A few cells seen at km 0.0 and km 1.0.
- Gomphonema abbreviatum* (Ag.) Kütz. (ii) At most stations, but more common in the uppermost ones.
- G. acuminatum* Ehr. (ii) One cell seen at km 2.7.

- G. angustatum* (Kütz.) Rabh. (i) As var. *producta* Grun. (ii) Throughout the river, but most common from km 43.2 to km 54.2.
- G. gracile* Ehr. (i) $30-40\ \mu \times 5-8\ \mu$; striae 11-14/10 μ (ii) A few cells seen at km 16.2, km 24.3 and km 44.2.
- G. longiceps* Ehr. (i) As var. *subclavata* Grun. Only cell noted: $30 \times 5\ \mu$; striae 12/10 μ . (ii) At km 9.2.
- G. olivaceoides* Hust. (ii) A few cells seen at km 4.4, km 16.2 and km 26.3.
- G. olivaceum* (Lyng.) Kütz. (ii) Throughout the river, but more common below km 16.2.
- G. parvulum* Kütz. (ii) A few cells seen at five sties from km 0.0 to km 65.6.
- G. sphaerophorum* Ehr. (ii) One cell seen at km 0.0.
- G. tergestinum* (Grun.) Fricke (ii) One cell seen at km 26.3.
- Denticula tenuis* Kütz. (i) $10-16\ \mu \times 5-6\ \mu$ (iv) Frequently present in samples, but usually in low numbers.
- Rhopalodia parallela* (Grun.) O. Müll. (ii) One cell seen at km 4.4.
- Hantzschia amphioxys* (Ehr.) Grun. (i) Only cell noted: $30 \times 5\ \mu$; striae 19/10 μ , carinal punctae 8/10 μ (ii) At km 35.2.
- Nitzschia acicularis* (ii) As with: (iv) At all times of year and throughout the river, though much more common in the lower reaches.
- N. acuta* Hantzsch (ii) A few cells seen at km 16.2, km 80.6 and km 92.2.
- N. acuminata* (W. Sm.) Grun. (ii) From km 80.6 to km 100.9.
- N. amphibia* Grun. (ii) One cell seen at km 0.0.
- N. apiculata* (Greg.) Grun. (ii) Three cells seen at km 80.6 (v) This species is usually found in estuarine or saltwater habitats.
- N. communis* Rabh. (ii) Common at km 80.6 and km 92.2, where it formed over 1% population.
- N. dissipata* (Kütz.) Grun. (i) $27-37\ \mu \times 6-10\ \mu$; carinal punctae 8-9/10 μ (ii) At almost all stations, but most common from km 2.7 to km 14.2.
- N. dubia* W. Sm. (ii) A few cells at sites from km 70.6 to km 100.9.
- N. filiformis* (W. Sm.) Hust. (i) Typical cell: $53 \times 6\ \mu$; striae 35/10 μ , carinal punctae 8/10 μ (ii) A few cells seen at km 80.6 and km 100.9 (iii) At km 67.5 on 10.IX.65.
- N. frustulum* Grun. (i) $23-24\ \mu \times 3.5-4\ \mu$; striae 22/10 μ , carinal punctae 10/10 μ . Var. *perpusilla* (Rabh.) Grun. also present: $9-10\ \mu \times 3-3.5\ \mu$; striae 21-22/10 μ , varinal punctae 10-12/10 μ (ii) A few cells seen at eight stations at and below km 9.2; var. *perpusilla* relatively more frequent in the lower reaches.
- N. fonticola* Grun. (i) $11-13\ \mu \times 3.5-4\ \mu$; striae indistinct, carinal punctae 14/10 μ (ii) Occasional, more common in the middle reaches, decreasing in the tidal reaches.
- N. hantzschiana* Rabh. (i) One cell noted: $23 \times 3\ \mu$; striae 26/10 μ , carinal punctae 7-10/10 μ (ii) At km 1.0.
- N. hungarica* Grun. (ii) One cell seen at km 92.2 (iii) At km 67.5 on 11.X.65.
- N. ignorata* Krasske (ii) At km 0.0, km 10.5 and km 92.2.
- N. kützingeriana* Hilse (ii) At km 0.0 and km 10.5.
- N. levidensis* (W. Sm.) Grun. = *N. tryblionella* Hantzsch var. *levidensis* (W. Sm.) Grun. (ii) At km 100.9.
- N. linearis* W. Sm. (ii) Throughout almost all the river, but less frequent in the tidal reaches.
- N. palea* (Kütz.) W. Sm. (i) $18-35\ \mu \times 2.5-4\ \mu$; carinal punctae 13-14/10 μ (ii) As with: (iv) Throughout the river and usually frequent.
- N. romana* Grun. (ii) Two cells seen at km 54.2.
- N. sigma* (Kütz.) W. Sm. (ii) One cell seen at each of km 80.6 and km 100.9.
- N. sigmoidea* (Ehr.) W. Sm. (ii) Occasional, more common from km 80.6 to km 100.9.
- N. stagnorum* Rabh. (i) Only cell: $28 \times 10\ \mu$; striae 22/10 μ , carinal punctae 8/10 μ .
- N. subtilis* Kütz. (iii) At km 68.4 on 10.IX.65.
- N. thermalis* Kütz. (i) As var. *minor* Hilse: $47 \times 8\ \mu$; striae 43/10 μ , carinal punctae 11/10 μ (ii) At km 80.6 and km 100.9.
- N. tropica* Hust. (i) Typical cell: $17 \times 2.5\ \mu$; striae 24/10 μ , carinal punctae 10-11/10 μ (ii) at km 9.2 and km 16.2.
- N. tryblionella* Hantzsch (i) As var. *debilis* (Arnott) A. Mayer: $24-25\ \mu \times 8\ \mu$; striae 12-14/10 μ , carinal punctae 7-9/10 μ (ii) At km 80.6 and km 100.9.
- N. vermicularis* (Kütz.) Grun. (iii) One cell seen at Lamb Bridge (km 92.2) on 23.III.66.

- Cymatopleura elliptica* (Bréb.) W. Sm. (ii) At km 80.6 and km 100.9.
C. solea (Bréb.) W. Sm. (ii) at km 70.6 and km 100.9.
Surirella angustata Kütz. (i) 20–35 $\mu \times$ 7–10 μ ; valvar canals 8/10 μ (ii) Occasional, throughout the river.
S. biseriata Bréb. (i) As var. *bifrons* (Ehr.) Hust. *punctata* Meister (ii) Two cells seen at km 2.7.
S. linearis W. Sm. (i) As var. *helvetica* (Brun.) Meister (iii) At inflow of Rookhope Burn (km 10.5) in August 1966.
S. ovata Kütz. (i) 12–54 $\mu \times$ 10–30 μ (ii) Throughout the river and often frequent.

DISCUSSION

Comparison of diatom floras from different rivers is made difficult by taxonomic problems, and by the fact that many species occur in very small proportions and thus the total list is much influenced by the total number of cells counted. However, it does seem worth making some comparisons. 168 species have now been recorded from R. Wear, 148 for R. Tees and 402 for the whole of the R. Danube (Szemes, 1967).

78 species have been recorded from R. Wear but not R. Tees. At least 54 are probably not due to any taxonomic difficulty. None of these species are so frequent in R. Wear that a real difference in relative abundance would seem to be almost a certainty, but the following are the most likely candidates: *Anomoeoneis exilis*, *Navicula atomus*, *N. integra*, *N. menisculus*, *N. subatomoides*, *Gomphonema abbreviatum*, *Denticula tenuis* (especially), *Nitzschia frustulum*.

58 species have been recorded from R. Tees but not R. Wear. At least 51 are probably not due to any taxonomic difficulty. Of these the following are the species which seem the most likely to show a real difference between the two rivers: *Eunotia arcus*, *Cymbella cistula*, *C. lanceolata*, *C. pusilla*, *Gomphonema lanceolatum*, *Nitzschia sublinearis*. *Cymbella pusilla* was recorded as common by Butcher, and was found again by Whitton and Dalpra, so this seems almost certain to differ in abundance in the two rivers.

In conclusion it may be stated that the diatom floras of the two rivers are rather similar. However, greater differences have been found between R. Wear and R. Tees than between R. Tees sampled at two time intervals separated by over thirty years. *Denticula tenuis* especially appears to be characteristic of R. Wear and *Cymbella pusilla* of R. Tees.

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THE LEPIDOPTERA OF YORKSHIRE

(continued from 1968, p. 56)

Cucullia absinthii Linn. (Wormwood Shark).

This moth was added to the county list when W. Reid found larvae near Rotherham (63) in 1953 and took specimens at light in Sheffield (63) in 1954. It has since spread rapidly and larvae have been found commonly on slag heaps and waste ground in South Yorkshire and as far north as Dishforth (65) where the food-plant was abundant alongside road-works on A1.

63. Barnsley; Bradford, 1964; Catcliffe; Doncaster, 1962 to 1966; Rotherham; Triangle, near Halifax, 1959; Wakefield; Wath-on-Deane; Wombwell.

64. Kirkstall, 1956.

65. Dishforth, larvae, 1963.

Anarta myrtili Linn. (Beautiful Yellow Underwing).

Well distributed and often common where there is an extensive area of Heather.

Panemeria tenebrata Scop. (Small Yellow Underwing).

Very local where it occurs but widely distributed and probably often overlooked.

62. Strensall, 1932; Thirsk, 1948.

63. Edlington, 1919; Emley Woodhouse, 1920; Secker Vale, near Barnsley, 1956; Skelmanthorpe, 1920; Worsborough, 21st May, 1949.

64. Askham Bog, 5th June, 1960; Bolton Percy, 22nd May, 1943; Farnley, 15th June, 1941; Gateforth and Selby district, on canal banks; Goldsborough, on river bank; Knaresborough.

Pyrria umbra Hufn. (Bordered Sallow).

Not widely distributed, taken sporadically inland but sometimes plentiful on the coast.

61. Filey, larvae common in 1959; Kilnsea, larvae common; Selby, once; Weaverthorpe.

64. Knaresborough, 21st June, 1959.

Heliothis peltigera Schiff. (Bordered Straw).

This rare migrant does not often come so far north.

61. Hull, larvae on Marigolds in 1947.

63. Little Horton, near Bradford, two, 26th August, 1955 and 6th May, 1958; Skelmanthorpe, 28th August, 1947.

64. Harrogate, one at M.V. light 16th March, 1957.

PLUSIIDAE

Eustrotia uncula Clerck (Silver Hook).

In Porritt's time this moth was known only from Askham Bog (64) but it has not been seen there for over fifty years; we have, however, two other localities.

61. Skipwith Common, regularly on the eastern fringes.

64. Morton's Bog, near Selby, 1952 and 1964.

Rivula sericealis Scop. (Straw Dot).

Scarce throughout the county although it may perhaps be overlooked; there is only one recent record.

62. Buttercrambe Woods, plentiful, 23rd August, 1942.

Phytometra viridaria Clerck (Small Purple-barred).

Very local, but cannot be as scarce as the paucity of records suggests.

62. Strensall; Douthwaite Dale near Kirby Moorside, 18th May, 1959.

Scoliopteryx libatrix Linn. (Herald).

Widely distributed but not often reported in any numbers except perhaps as larvae.

61. Skipwith, not uncommon.

62. Buttercrambe, 1933; Pickering, 13th September, 1958.

63. Sheffield; Haw Park.

64. Askham Bog, larvae common in 1945; Barlow near Selby; Bishop Wood; Harrogate, often found hibernating in a cellar, 1959 to 1965; Settle, in a cave in 1930; Leeds.

Polychrisia moneta Fabr. (Golden Plusia).

Very rare in Porritt's time but it has now become common and widely distributed, the larvae being frequent in gardens on delphiniums and monkshood.

Plusia chrysis Linn. (Burnished Brass).

Widely distributed and often common even in industrial areas.

P. bractea Fabr. (Gold Spangle).

Widely distributed but always recorded in small numbers.

61. Hornsea Mere, 27th June, 1912; Skipwith Common, 1st August, 1959.
62. Sandburn, 3rd August, 1958; Scarborough, two in 1959.
63. Lepton, 2nd July, 1960; Sheffield, one in 1959; Triangle near Halifax, a few in 1959 and subsequently.
64. Burley Woodhead, 1st August, 1960; Harrogate, regularly 1958 to 1966; Knaresborough, several 1958-62.

P. festucae Linn. (Gold Spot).

Widely distributed and sometimes common in marshy areas. It has however also been reported from remote and bleak moorland districts. A second brood is sometimes seen in September.

Available information does not enable us to record the recently separated species *P. gracilis* Lempke.

61. Skipwith Common, frequent.
62. Strensall Common, frequent.
63. Sheffield, common.
64. Denton Moors; Harrogate, frequent; on high ground between Ingleborough and Whernside; Bishop Wood; Askham Bog; Leeds, 1960, and an unusual date, 2nd October, 1962.

P. iota Linn. (Plain Golden Y).

Well distributed and sometimes common at M.V. light.

P. pulchrina Haw. (Beautiful Golden Y).

Also well distributed. It is commoner than *P. iota* in the West Riding, as at Bradford (63) and Harrogate (64), but is much less common than the former species further east, particularly around Selby (61 and 64).

P. acuta Walk.

Only four specimens of this rare migrant have been taken in Britain. One of these was at M.V. light operated by W. Beck at Knaresborough (64) in 1955.

P. gamma Linn. (Silver Y).

Being a migrant, this moth is of very variable occurrence, in some years it is exceedingly abundant particularly in the autumn.

P. interrogationis Linn. (Scarce Silver Y).

Widely distributed in suitable high moorland areas.

62. North Yorkshire Moors from Danby to Scarborough; Wass Bank, 1933.
63. Sheffield, on moors near the Derbyshire border.
64. Blubberhouses, 1956; Harrogate, occasionally at M.V. light; Pateley Bridge, 1919.

Abrostola triplasia Linn. (Dark Spectacle).

This species is certainly much less common than the next but cannot be so sparingly distributed as the records suggest.

63. Bradford; Sheffield.
64. Harrogate; Leeds, quite common 1957 to 1962, scarce in 1963 and 1964, not seen since.

A. tripartita Hufn. (Spectacle).

Well distributed and often common.

Euclidimera mi Clerck. (Mother Shipton).

Well distributed in the eastern part of the county on railway embankments and similar habitats, but there are few records for the West Riding apart from the extreme south.

61. Selby district; Skipwith Common.
62. Pickering; Thornton-le-dale.
63. Sheffield, fairly common; Walton near Wakefield; Sprotborough.
64. Selby district; Askham Bog, one in 1960.

Ectypa glyphica Linn. (Burnet Companion).

More local than the last species, but its distribution extends further to the north-west.

61. Selby district.
62. Pickering; Pillmoor; Thornton-le-dale; Strensall Common, one in 1955.
64. Selby district; Spofforth.

Mormo maura Linn. (Old Lady).

Widely recorded, though not as frequently as formerly. It frequents river banks

and prefers the sugar patch to the M.V. light. It has also been found in Sand Martins' burrows.

61. Skipwith Common, at sugar 9th July, 1959.

63. Bradford; Elland, frequent up to 1950; Oakenshaw; Sheffield, frequent; Shipley, four larvae in 1942; Triangle near Halifax, two at M.V. light in 1957; Wakefield, one 16th August, 1946 and two in 1958.

64. Barlow, August, 1958; Bolton Abbey, fairly common in 1946; Copmanthorpe, August, 1956; Harrogate, once at M.V. light in 1958 but more often at sugar in subsequent years; Knaresborough, in Sand Martins' burrows in 1965; Pateley Bridge; Selby, at sugar 1933.

Catocala fraxini Linn. (Clifden Nonpareil).

No record since Porritt's List.

C. nupta Linn. (Red Underwing).

Apart from the single specimen recorded in Porritt's List, this species was unknown in the county until L. G. F. Waddington took three at sugar at Doncaster (63) in 1941. It was then recorded quite widely in the southern and eastern parts for a period of about twelve years but has not been seen since 1953.

61. Cottingham, 27th August, 1943; Gilberdyke, 21st September, 1943; Selby area, frequent in the late 1940's; Spurn, once.

62. Buttercrambe, 6th September, 1947; near York, 24th September, 1941.

63. Doncaster, plentiful 1941 to 1946, twice in Sandal Beat Wood in 1953.

64. Selby district.

Lygephila pastinum Treits. (Blackneck).

Although it used to occur in the south, it is now only known from the eastern part of the county where it occurs on the Wolds and on the coast.

61. Thixendale.

62. Burniston, on the cliffs; Ganton.

Zanclognatha tarsipennalis Treits. (Fan-foot).

Widely distributed but not common.

63. Deffer Wood, 31st July, 1957; Sheffield, frequent; Triangle near Halifax, 1959.

64. Harrogate, four at M.V. light 17th July, 1965; Leeds; Selby, occasionally; Askham Bog.

Z. nemoralis Fabr. (Small Fan-foot).

Commoner and more widely recorded than the last species.

61. Spurn, 1949.

63. Bradford; Meltham; Sheffield; Wakefield; Wombwell.

64. Askham Bog; Bishop Wood; Harrogate; Leeds; Selby.

Herminia barbalis Clerck (Common Fan-foot).

Not recorded since Porritt's List.

Hypena proboscidalis Linn. (Snout).

Generally distributed and often common.

Schrankia taenialis Hubn. (White-line Snout).

Not recorded since Porritt's List.

S. costastrigalis Steph. (Pinion-streaked Snout).

Very local in damp places. We have only two localities but it would probably be found elsewhere if searched for.

61. Skipwith Common, regularly.

64. Askham Bog.

MONOCTENIIDAE

Brephos parthenias Linn. (Orange Underwing).

Fairly well distributed where there is a well-established area of Birch.

61. Skipwith Common.

63. Deffer Wood; Doncaster; Sheffield; Secker Wood.

64. Birstwith; Morton's Bog near Selby.

B. notha Hubn. (Light Orange Underwing).

There is only one record since Porritt's List, for Bishop Wood (64), but it is undated and repeated searches have not confirmed it. It is very doubtful if it now occurs anywhere in the county.

Odezia atrata Linn. (Chimney-sweeper).

Locally common, especially in the West Riding and the hillier areas. Although

partial to dry grassy slopes, such as railway embankments it is seldom reported from the south-east of the county where such habitats abound.

Alsophila aescularia Schiff. (March Moth).

Generally distributed and often common.

GEOMETRIDAE

Pseudoterpna pruinata Hufn. (Grass Emerald).

There are surprisingly few records for this moth in the county although its food-plants, Gorse and Broom abound.

61. Selby district; Skipwith.

63. Doncaster area; Rossington Bridge.

64. Harrogate, occasionally; Knaresborough, in Birkham Wood, 1962; Selby district.

Hipparchus papilionaria Linn. (Large Emerald).

Fairly widely distributed, it is often common on the low lying heaths, Skipwith (61) and Strensall (62). It is also taken frequently over a very wide area, in fact wherever there is a well-established growth of Birch.

Comibaena pustulata Hufn. (Blotched Emerald).

Fairly well distributed in the eastern and southern parts of the county. Apparently confined to the lower ground being reported from Knaresborough but not Harrogate.

61. Selby district; Skipwith Common.

62. Strensall Common.

63. Doncaster; Womersley.

64. Bishop Wood; Knaresborough; Askham Bog.

Iodis lactearia Linn. (Little Emerald).

Formerly not uncommon, but either it is overlooked or it has largely disappeared. There are only two recent records.

61. Langwith, at the Y.N.U. meeting on 19th June, 1965.

64. Bishop Wood, 1967.

Hemitea aestivaria Hubn. (Common Emerald).

This moth is certainly not common in Yorkshire and records are very sparse.

61. Selby district, occasionally; Skipwith Common, 1965.

62. Buttercrambe, one larva in 1946.

64. Colton near York, 1962.

Sterrhia muricata Hufn. (Purple Bordered Gold).

There is only one known locality in the county, Thorne Moor (63) from which it has been recorded twice, in 1939 and again in 1955.

S. seriata Schrank. (Small Dusty Wave).

Widely distributed and often taken in gardens in urban areas.

S. sylvestriaria Hubn. (Dotted Border Wave).

Very local and not often recorded except on Strensall Common.

61. Allerthorpe Common, July, 1957 and 1960; Skipwith Common, but not recently.

62. Strensall Common, regularly in recent years.

63. Thorne Moor, but not recently.

S. fuscovenosa Goeze. (Dwarf Cream Wave).

The only locality where it is known to occur in the county is at Kilnsea and Spurn (61), where it has been taken several times. The first record in July, 1948 by Dr. W. D. Hincks and H. N. Michaelis was an addition to the county list since Porritt's original record was cancelled in the supplement to his list.

S. inornata Haw. (Plain Wave).

Evidently widespread but probably often overlooked due to its similarity to one form of the next species.

61. Skipwith Common, frequent.

62. Strensall Common.

63. Deffer Wood, 1922; Huddersfield district; Sheffield.

64. Grassington, 1930; Harrogate, one in 1964.

S. aversata Linn (Riband Wave).

Well distributed and often common.

S. biselata Hufn. (Small Fan-footed Wave).

Not often recorded, but those records we have suggest a fairly wide distribution.

61. Kilnsea, 1948; Selby area.

62. Cayton Bay.

63. Womersley, 1967.

64. Hetchell Craggs, near Bardsey; Harrogate, occasionally; Leeds; Bishop Wood; Askham Bog.

S. dimidiata Hufn. (Single Dotted Wave).

As with so many of the smaller and generally common species we have only a small number of very scattered records.

61. Kilnsea, common; Selby; Skipwith Common.

62. Strensall Common.

63. Skelmanthorpe, 1922.

64. Harrogate.

S. emarginata Linn. (Small Scallop).

Very local and recorded occasionally only from Strensall Common (62) in recent years.

Scopula floslactata Haw. (Cream Wave).

Local and not as widely reported as might be expected.

61. Cliffe Common.

62. Baysdale, on a Y.N.U. visit on 19th June, 1960; Buttercrambe Wood, 1959.

63. Deffer Wood, 1952.

64. Bishop Wood; Ilkley.

S. immutata Linn. (Lesser Cream Wave).

Very local and uncommon; may on occasions be confused with the previous species.

62. Buttercrambe Woods, 1940 and 1941.

63. Chevet near Wakefield, 8th July, 1946; Thorne Waste, July, 1909.

S. emutaria Hubn. (Rosy Wave).

We have only one locality for this marsh frequenting, coastal species, Kilnsea (61), where it is well established.

S. imitaria Hubn. (Small Blood-vein).

Scarce, there are only three records in recent times.

61. Kilnsea, 1948 and 1952; Skipwith Common, one, 11th July, 1937.

S. rubiginata Hufn. (Tawny Wave).

Not recorded since Porritt's List.

S. ternata Schrank. (Smoky Wave).

Although there are plenty of apparently suitable localities for this very local insect, it has only been found in a few of them.

62. North Yorkshire Moors near Scarborough.

63. Dunford Bridge, 1910; Langsett, on a Y.N.U. visit on 6th July, 1935.

64. Brimham Rocks; Grassington, 1965; Pateley Bridge, 1919.

Calothyranis amata Linn. (Blood-vein).

Scarce in the West Riding but often common in the east particularly around Selby (61 and 64) where a second brood sometimes occurs in September.

Cosymbia porata Fabr. (False Mocha).

There is only one record since Porritt's List; a single specimen taken in Buttercrambe Woods (62) in 1957.

C. punctaria Linn. (Maiden's Blush).

We have very few recent records and these are widely separated.

61. Selby district, occasionally.

62. Buttercrambe Woods, 14th June, 1932.

63. Haw Park, Wakefield, 1910.

64. Harrogate, at the Y.N.U. meeting in 1949; Selby district, occasionally.

C. linearia Hubn. (Clay Triple-lines).

Not recorded since Porritt's List.

C. annulata Schulze. (Mocha).

It used to occur in the south of the county, particularly in Edlington Wood (63), but has not been recorded there for fifty years. A single specimen was taken near Knaresborough (64) in the late 1950's and this is the only recent record.

C. albipunctata Hufn. (Birch Mocha).

This was formerly only recorded from Strensall Common, it still abounds there but we have two additional localities.

61. Allerthorpe Common, 1960; Skipwith Common, 1964 and 1966.

62. Strensall Common, abundant.

Anaitis plagiata Linn. (Treble Bar).

Fairly widely distributed where the food-plant *Hypericum* (St. John's Wort) is established, particularly in the hillier districts to the north and west.

A. efformata Guen. (Short-clasped Treble Bar).

This replaces the last species in the south and east and is often abundant on railway embankments and similar habitats.

Carsia paludata Thunb. (Manchester Treble Bar).

Not recorded since Porritt's List.

Chesias legatella Schiff. (Streak).

There are remarkably few records of this usually common moth. Presumably the areas where Broom grows extensively are not often worked late in the year.

61. Skipwith Common; Selby district.

63. Halifax.

64. Harrogate, one, 6th October, 1957; Selby district.

C. rufata Fabr. (Broom-tip).

Only once reported since Porritt's List, in the Doncaster area early in the century. (It still occurs just across the Nottinghamshire border near Bawtry.)

Nothopteryx polycommata Hubn. (Barred Tooth-striped).

This was added to the county list when C. I. Rutherford took a female at rest on an Ash trunk in Grass Wood (64) on 17th May, 1959. This habitat is very similar to the well-known locality for the species at Witherslack in Westmorland. Its presence in Grass Wood was confirmed when a second specimen was taken on 20th May, 1962.

N. carpinata Borkh. (Early Tooth-striped).

Much more local than formerly but still taken regularly in the Scarborough district.

62. Scarborough district, particularly in Forge Valley; Strensall Common, occasionally.

64. Askham Bog.

Acasis viretata Hubn. (Yellow-barred Brindle).

Very scarce and not recorded in the county for some forty years.

62. Scarborough, in the early 1900's.

64. Aysgarth, 23rd May, 1910; Grassington, 6th June, 1927.

Lobophora halterata Hufn. (Seraphim).

Two specimens taken in 1965 are the only ones recorded in the last sixty years.

62. Strensall Common, two on Aspen in 1965.

63. Wadworth Wood, June, 1906.

Mysticoptera sexalisata Hubn. (Small Seraphim).

Not recorded since Porritt's List.

Triphosa dubitata Linn. (Tissue).

Seldom common but it is recorded periodically over a very wide distribution.

61. Selby.

62. York district.

63. Bradford district.

64. Grassington; Harrogate; Knaresborough; Malham.

Calocalpe cervinalis Scop. (Scarce Tissue).

Only recorded once in the last fifty years, a single specimen at M.V. light at Harrogate (64) on 9th May, 1957.

C. undulata Linn. (Scalloped Shell).

We have no records since the first World War, but there were three in the early part of the century.

62. Scarborough district; York district.

65. Bedale, in a Pine wood in 1914.

Philereme vetulata Schiff. (Brown Scalloped).

Larvae have been found in a new locality recently but this is the only record since the second World War; there were several records between the wars.

61. Selby district, two larvae in 1966.

62. Buttercrambe Woods, in the 1930's.

64. Askham Bog, larvae up to 1930 but not since.

P. transversata Hufn. (Dark Scalloped).

Like the last species, most of the former colonies seem to have died out but one

new locality has recently been found.

63. Sheffield, one at light in July, 1954.

64. Askham Bog, up to 1930; Grass Wood, several at light on 10th August, 1963, after which record larvae were sought and found quite freely in subsequent years.

Ecliptopera silaceata Schiff. (Small Phoenix).

Widely distributed and often not uncommon.

Lygris prunata Linn. (Phoenix).

Local and seldom recorded in any numbers.

61. Filey area, regularly; Allerthorpe Common.

64. Grassington, July, 1911; Knaresborough, frequent in 1958 and 1959; York district, larvae in 1932.

L. testata Linn. (Chevron).

Widely distributed and often common in moorland areas.

L. populata Linn. (Northern Spinach).

Not reported from the low-lying parts of the county but widely distributed on higher ground wherever Bilberry abounds.

L. mellinata Fabr. (Spinach).

Generally found in built-up areas where currants and gooseberries are grown in the gardens.

L. pyraliata Schiff. (Barred Straw).

Widely distributed and although never very common it is frequently recorded.

61. Filey; Kilnsea; Skipwith; Thixendale.

63. Gargrave, 1949.

64. Askham Bog; Buckden Pike; Harrogate; Skipton, 1932; Grassington.

Cidaria fulvata Forst. (Barred Yellow).

Another moth with a very wide distribution but which is seldom very numerous; it is however usually taken in any district in which its food-plant, the wild rose, flourishes.

Electrophaes corylata Thunb. (Broken-barred Carpet).

Widely distributed and often common.

Dysstroma truncata Hufn. (Common Marbled Carpet).

Generally common throughout the county.

D. citrata Linn. (Dark Marbled Carpet).

Less common than the former species but also widely distributed. In some areas, particularly Grassington (64), it is common. It is probably often confused with *D. truncata*.

Chloroclysta siterata Hufn. (Red-green Carpet).

Very scarce in the county. Isolated records are not always to be relied upon due to the similarity of the next species, thus a record for Grassington (64) requires confirmation. Our only reliable records are for the Scarborough district (62) prior to 1940.

C. miata Linn. (Autumn Green Carpet).

Also a very local species in the county but it has been recorded over a fairly wide area with a decided bias towards the hillier regions.

63. Gargrave.

64. Garforth; Grassington, frequently; Harrogate, rare; Knaresborough; Malham.

Thera obeliscata Hubn. (Grey Pine Carpet).

Generally common wherever there is an adequate growth of the food-plant.

T. cognata Thunb. (Chestnut-coloured Carpet).

Not recorded since Porritt's List.

T. firmata Hubn. (Reddish Pine Carpet).

Much more local than *T. obeliscata* and seems to be confined to Pine woods whereas the former species frequently occurs in gardens and other districts where there is a scattered growth of Pine.

61. Everingham, 1923; Skipwith Common.

62. Strensall Common.

63. Wakefield.

64. Bishop Wood, one on 14th July, 1955; Grassington; Harrogate, rare.

T. juniperata Linn. (Juniper Carpet).

Not recorded since Porritt's List.

Lampropteryx suffumata Schiff. (Water Carpet).

A very local moth but often common where it does occur. Two of the well-known extreme forms also occur quite frequently in some localities.

62. Pickering, common in Gundale; Scarborough, common in Forge Valley in 1967.

63. Clayton West, in 1921 including ab. *porrittii*.

64. Bishop Wood, well established and including both ab. *piceata* and ab. *porrittii*, the latter on 3rd May, 1963; Buckden, 1910; Grassington, 1911 and 1965; Harrogate, occasionally, including ab. *piceata* on 5th May, 1960; Malham, 1909; Saxton, 1924; York district.

Xanthorhoe munitata Hubn. (Red Carpet).

The best known locality in the county for this mountain species is Malham (64) but there are several older records from other areas.

62. Scarborough, an old record.

63. Huddersfield, 1910.

64. Arncliffe; Malham, frequent near the Tarn.

65. Barden, 1917.

X. ferrugata Clerck. (Dark-barred Twin-spot Carpet).

Well distributed and often common particularly in the eastern part of the county.

X. spadicearia Schiff. (Red Twin-spot Carpet).

Much less common than the previous species but by no means rare. 🐛

61. Filey; Kilnsea; Selby district.

62. Hawaby.

64. Copgrove.

X. designata Rott. (Flame Carpet).

Widespread and sometimes quite common.

61. Skipwith Common.

62. Levisham; York district.

64. Appletreewick, 17th June, 1950; Bishop Wood, 6th August, 1955; Grassington; Harrogate; Malham.

X. montanata Borkh. (Silver-ground Carpet).

Widely distributed and often common.

X. fluctuata Linn. (Garden Carpet).

Very widely distributed and occurs throughout the summer so that it is commoner than its numbers at any particular time suggest.

Colostygia olivata Borkh. (Beech-green Carpet).

Local in hilly places, usually on limestone.

62. Pickering, in Gundale; Scarborough district.

64. Arncliffe; Grassington, not uncommon; Sedbergh.

C. pectinataria Knoch. (Green Carpet).

Widely distributed and sometimes common, both on moors and in woods.

C. salicata Hubn. (Striped Twin-spot Carpet).

Now very local and by no means as widespread as formerly, in its better localities, however, it still abounds.

61. Bugthorpe, 3rd August, 1933.

63. Bingley, "formerly".

64. Brimham Rocks, 8th June, 1966; Upper Grass Wood, common; Ribbleshead.

C. multistrigaria Haw. (Mottled Grey).

Rather local with a preference for moorland areas.

61. Skipwith Common.

62. Scarborough district.

63. Deffer Wood; Little Horton near Bradford; Huddersfield; Penistone, 1908; Sheffield, on the moors.

64. Esholt near Guiseley; Harrogate, not uncommon; Morton's Bog near Selby; Breary Marsh, Leeds, abundantly on 30th March, 1968.

C. didymata Linn. (Twin-spot Carpet).

Widely distributed in woods and on moors but particularly plentiful on the higher moors of the West Riding.

BOOK REVIEWS

Torrey Canyon Pollution and Marine Life, edited by J. E. Smith. Pp. ix + 196 with 28 plates. Cambridge University Press. 55/-.

The commendable speed with which this excellently produced book has been written and published parallels the drama and high level of public interest in the events that followed the stranding of this oil tanker. The immediate public concern was for the amenities and holiday beaches of Devon and Cornwall, but for biologists the more insidious problem was the effects on marine life of both the oil itself and the enormous quantities of detergents applied to disperse the oil.

This book describes the intensive efforts made by the staff of the Marine Biological Laboratory at Plymouth to assess the biological damage at sea and along the coastline, and to investigate in the laboratory the comparative effects of detergents used. With the many detailed maps several of the chapters read almost like improvised military operations, and indeed one of the striking things to emerge is the almost complete lack of preparations for this type of large scale emergency.

On the biological side the effects of oil itself were not catastrophic except on sea birds, and it is now clear that the natural processes of evaporation and degradation should be allowed to take place, provided areas of high amenity value are not threatened, before resorting to unrestricted use of detergents. This was not however appreciated at the time and although the detergents proved less damaging to planktonic life than had been feared, the effects on the heavily sprayed parts of the coastline and the adjacent sublittoral are such that many years may elapse before balanced populations are restored.

In a final chapter 'Some lessons learnt' the various ways of dealing with such a catastrophe are discussed. If the recommendations are heeded, and if public and official awareness of the constant danger of pollution is heightened some lasting benefit may be derived from this event. J.R.L.

A Naturalist in Russia; Letters from Peter Simon Pallas to Thomas Pennant, edited by Carol Urness. Pp. 189 with 47 text figures. Minnesota University Press. London: Oxford University Press. 1968. 71/6 net.

In the eighteenth century the shape of science was beginning to take on its modern form and this was a time too of active exploration and collection of biological material, of detailed description and attempted classification, and not least of intensive scientific letter writing. In all these fields Peter Simon Pallas was an outstanding exponent and the present volume is a collection of his letters to the equally versatile English, or rather Welsh, naturalist, Thomas Pennant. Primarily they are concerned with the zoology of Pallas' great journey across European and Asiatic Russia and back at the behest of the Empress Catherine; but they contain in addition all sorts of acute observations on a fascinating range of topics. Unfortunately the replies to these letters from Pennant have all disappeared but the book as it stands, excellently produced and illustrated by charming sketches from other works of Pallas, can serve as a graceful tribute to one of the really great naturalists. T.K.

Reptiles, by Angus d'A. Bellairs. Second edition. Pp. 200 with twelve text-figures. Hutchinson University Library. 11/6.

This is a welcome reissue of a most useful little book. New work in the ten years since it first appeared has been incorporated to some extent within the text but is mainly summarised in an additional chapter and, in such a wide-ranging review of the subject, this is quite a convenient solution. For the book deals, in well-chosen proportions, both with the variegated fossil groups which dominated the world during the mesozoic and some of which gave rise to the birds on the one hand and to the mammals on the other, and also with the general anatomy and habits of reptiles. Particularly there is a more extended account of the lizards and snakes, in which an impressive amount of information is presented in a pleasantly readable form. In a future edition the inclusion of the palatal bones in the dermal 'shell' (p. 19) could be omitted and the elastic ligament in snake jaws included, and perhaps a little more space could be found for the evolution of locomotion and the importance of the swinging quadrate in the feeding of animals which swallow their prey whole; however, as it stands the book is thoroughly to be recommended as a serious general introduction to the reptiles. T.K.

Britain's Green Mantle, Past, Present and Future by A. G. Tansley, 2nd edition by M. C. F. Proctor. Pp. 327 with 12 figures and 140 photographs. George Allen and Unwin. 50/-.

This second edition of a classic book on the vegetation of the British Isles has been brought up-to-date by M. C. F. Proctor, an ecologist from Exeter University. Those familiar with the first edition will realise that the greater part of the text remains unchanged though there are some important alterations notably in the first chapter where new knowledge given by pollen analysis has been worked into Tansley's original account of vegetational change since the last glaciation. This and the succeeding chapter, covering the historical period, put the whole account of present day vegetation in perspective and make the later chapters more meaningful. Other additions include sections on myxomatosis and important recent work such as that of Perring on chalk grassland and Lambert and her co-workers on the Norfolk Broads. Tansley's last chapter outlined possible future changes in vegetation and the proposals for nature conservation then being considered. Many of Tansley's hopes and desires for conservation have now been realised and Proctor has completely rewritten the final chapter to give the history and present status of conservation in Britain.

Another major change in the book lies in the illustrations. Many of the original illustrations could not be used for this edition and have been replaced by over a hundred of Michael Proctor's own photographs. These are very fine and it is difficult to think of a book on British vegetation which is better illustrated.

Altogether this second edition can be recommended to all who want information about the many types of vegetation found in these islands. D.D.B.

Flies of the British Isles by Charles N. Colyer in collaboration with Cyril O. Hammond. Pp. 384, 25 coloured and 28 black and white plates, text figures and diagrams. *Wayside and Woodland Series*, Frederick Warne, second edition, 1968. 55/-.

The second edition of this excellent guide to the flies appears in the new, larger format of this series. Almost twice the bulk of the previous edition, the increase in size results from the use of a larger type face and wider margins. The main alterations noted are the additions to the lists of references cited at the end of each chapter, but there are some minor emendations in the text. The larger size gives a more handsome appearance but the illustrations are not as pleasing as those in the first edition. While the same blocks appear to have been used in printing the black and white plates, new blocks have been made from the original drawings for the coloured plates and a reduction in the amount of black used results in a less clear picture, e.g. the figures of *Tanyptera atrata*. Entomologists may well cherish the plates of their first edition while welcoming the extended bibliography of the new one.

In the years since its first publication this work must have provided many with their first introduction to the flies. It remains an outstandingly successful example of what such a work should be. J.H.F.

Instant Weather Forecasting by Alan Watts. Pp. 64 with 24 colour photographs. Adlard Coles. 18/-.

Atmosphere, Weather and Climate by R. G. Barry and R. J. Chorley. Pp. 319 with 27 plates and 144 text figures. Methuen, University Paperback. 25/-.

B.B.C. weather forecasts are usually reliable guides as to what meteorological changes may be expected within the next day. But local conditions may vary widely and a forecast which is largely correct for a region may not be applicable to particular regions of it. The object of Alan Watts' book is to enable the user to draw his own conclusions about his own area. This is done by means of 24 colour photographs depicting skies with different cloud formations associated with deteriorating, improving or stable weather conditions. By matching the pictures as nearly as possible with the local sky and referring to the accompanying notes on major clues to be observed the inference is provided and the tables opposite each photograph give the probable trends and duration of the changes to be expected. There will be times when the weather fails to obey the rules but it is claimed that a 75% accuracy may be expected.

Barry and Chorley's book is a comprehensive and technical treatment of climatology on a world basis, incorporating recent advances in the subject. It is suitable for students of physical geography and academically minded workers in fields in which climatic factors have a significant bearing on their studies.

Excursion Flora of the British Isles by A. R. Clapham, T. G. Tutin and E. F. Warburg. Second edition. Pp. xxxv + 586. Cambridge University Press. 30/-.

As a condensed version of the larger Flora by the same authors this book is the most concise, portable and up-to-date account of British vascular plants. Since the publication of the first edition nine years ago the first volume of *Flora Europaea* has been issued. The treatment of the ferns in that work has been adopted in the new edition of the present book and the revised account of this group along with the consequential changes in the key to the Families represent the chief alterations in the new edition. There are, inevitably, some nomenclatural changes and occasional amendments and additions to the information dealing with distribution. Otherwise both the format and contents remain unaltered. W.A.S.

Invertebrate Identification Manual by R. A. Pimentel. Pp. 151. Reinhold. 1967. £2 2s.

This is essentially a field book for recognition of invertebrate animals by direct comparison with the illustrations, which occupy, *in toto*, half of the book and which, for the most part, are simple, clear line drawings. They are supported by a text consisting of a brief diagnosis of each taxon ranging from Phylum to Order or Family, together with an indication of habitat. It is intended for the N. American fauna but, since genera and species are not indicated, it would be useful also in Europe. For the layman, however, the text would be too technical and the book is marred for the serious student by the use of only popular names in the legends of the illustrations. E.B.

Sky Island by Weldon F. Heald. Pp. ix + 166 with 65 photographic illustrations, 16 drawings and end-paper maps. D. Van Nostrand Co. Inc., London. 56/-.

The island of this book is the Chiricahua mountain range which rises from the hot and arid desert lands of southern Arizona to heights of close on 10,000 ft. 'From valley floor to mountain summit are stacked one above another all the climatic life zones one would meet on a 1,600 mile journey from northern Mexico to Canada's Hudson Bay.' It is a region of great, often spellbinding, natural beauty and it is also one of the few regions in America which is still commercially unexploited, an unspoiled sanctuary rich in natural history interest. Here Weldon Heald and his wife lived for many years and this is the story of their life in this delectable wilderness.

This is an unpretentious but evocative story of animals and plants, of the author's stream of visitors, many of them naturalists, and of the enduring fascination of their surroundings. The photographs alone tell of the superlative beauty of these mountains; but they are not used as pegs on which to hang the text. Weldon Heald was (he died shortly after the book was completed) a professional writer and this story gains much by the manner of its telling. There is a deceptive ease and simplicity about his descriptions and anecdotes which stems from his expertise as a writer and which greatly sharpen the reader's pleasure.

The Healds regarded their life in the Chiricahua mountains as an escape to and not from reality. One must have inner resources to draw upon for such a life to be truly satisfying and many people who would like to emulate them would be less well equipped to do so. But those with a taste for beautiful and unfrequented places will welcome this vicarious escape from their computerised, atomic, space-age existence. I certainly agree with the contributor of the Foreword that 'In this book there is a flavour and substance as well as good sound philosophy of a kind not to be discovered in college courses'. W.A.S.

Seashore Animals of the Pacific Coast by M. E. Johnson and N. J. Snook. Pp. vi + 659 with numerous line drawings, black and white plates and xi colour plates. Constable. 36/-.

This very well illustrated book for amateurs is a non-technical account of the very abundant animal life of the Pacific coast. It combines general biological information about the phyla and species with identification, but lacking all keys except at the phylum level its use necessitates either prior knowledge of classification or the 'match the illustrations' approach. It is an unabridged printing of a 1935 edition, complete with photographs of laboratories long since replaced, and one feels that some attempt should have been made to check the reliability of the information and to modernise the reference list. J.R.L.

Ducks, Geese and Swans by **John Welman**. Pp. 124 with 29 sketches and 16 half-tone illustrations. Isaac Pitman. 20/-.

This is the seventh in the Brompton Library series *Instructions to Young Ornithologists*, and while the first six were offered at 12/6 to 15/- the present volume is priced £1. Frankly I do not consider that, value for money, the extra cost is justified. As the jacket blurb rightly says, 'There's something very special about ducks . . . Their stream-lined symmetry and sleek often brightly-coloured plumage appeal to the eye . . .'. How necessary then, especially for youngsters, are coloured illustrations. Yet there is not one in the whole book. When I came to the sketch of Barnacle Goose (p. 33) I found it quite pathetic. Later I found others even poorer. The cross-hatching on Eider (p. 59) is bold enough for noughts and crosses; the Goldeneye (65) looks so miserable that the white cheek spot could be mistaken for a falling tear-drop.

The text is occasionally clumsy or archaic, 'A man standing in the water seems to scare birds . . . little more than a cow come down to drink does trout'. 'No one can doubt the keen sight of geese who has approached a flock grazing in the open or the hearing of ducks flushed by the cocking of a gun in a hide' (and this for youngsters!).

Several comments are either inaccurate or misleading. In the British Isles, we are told, Mergansers nest only in Scotland. The Goldeneye's courtship display is unlikely to be seen in this country. 'The easiest to spot at a distance were the *Pintail drakes* because they swam with their breasts very low in the water and their big spatulate bills pointing down.' 'In the British Isles the Common Eider breeds and is resident in northern Scotland and *Iceland* (my italics), and in England only in the Farne etc. . . .' A typographical error on p. 111 separates the range and notes on the Spur-winged Goose from the description of the species by a heading which should follow. The range for Canvasback is missing. Our own Charles Waterton was talking of 'closet-naturalists' well before W. H. Hudson did.

The book contains chapters on the European species (a better section) and on ducks, geese and swans of the world. There are discussions on taxonomy, migrations, etc. While it is useful to have 'some account of all the 145 known species, their distribution, habits and breeding and winter range' together in one handy volume this present account will not, I fear, satisfy many of our young ornithologists. R.F.D.

Natural History by **Brendan Lehane**. Pp. 128. Michael Joseph. 12/6.

Studying Nature, Books 1-4, by **John Clegg** and **J. C. Gagg**. Evans Brothers. Book 1, pp. 64, 7/9; Bk. 2, pp. 80, 8/6; Bk. 3, pp. 80, 8/6; Bk. 4, pp. 96, 9/6.

Teaching Science out of Doors (A collection of teachers leaflets). Frederick Warne. 13/6.

Nature Trails. Pp. 22. Natural Environment Research Council. Frederick Warne. 5/-.

All these books encourage the young in taking an interest in natural history through a scientific approach. Brendan Lehane has aimed at enabling the young naturalist to equip himself for successful expeditions into the field. He suggests a number of activities and includes geology and meteorology. His vocabulary is at times too advanced for the age for which he is writing, whilst on the other hand simplification of material sometimes verges on inaccuracy. However, his ideas are good and the sensible encouragement to join the local natural history society should ensure the continued growth of interest.

The *Studying Nature* series is full of activities for children throughout the Junior School. The books are varied, relevant and gay, with many attractive coloured illustrations. Active participation by the children is encouraged through enquiry, observation and recording. The material is arranged to suit the season in order of increasing difficulty. There is a good index in each book.

Science out of Doors consists of a series of leaflets covering a wide range of topics such as 'Outdoor Plant Studies', 'Nature Trails', and 'The Marine Aquarium'. They are full of information, well illustrated and with suggestions for further reference. Aimed at the Primary and Junior Secondary School level they have many ideas suitable for school science clubs.

Nature trails are explained more fully in the N.E.R.C. booklet. Details are given on how to set one up, its successful use and maintenance, and a section is written specially to show their place in school biology teaching. M.S.G.

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THE YORKSHIRE NATURALISTS' UNION

ORNITHOLOGICAL SECTION

In conjunction with Bradford Naturalists' Society, the Ornithological Section has arranged for Mr. R. P. Bagnall-Oakley to present his colour film 'Norfolk Bird Life through the Seasons' on Friday, 8th November 1968 at 7.30 p.m. in Victoria Hall, Saltaire, Shipley.

Tickets price 3/6d. may be obtained from: Mrs. K. L. Butcher, 11 Fernbank Drive, Baildon, Shipley, Mr. J. K. Fenton, Moor Cottage, Burley-in-Wharfedale, or Messrs. Skelton's, 64 Market Street, Bradford 1. B.T.O. and R.S.P.B. Christmas Cards and gift items will be on sale.

R.S.P.B. FILM SHOW, ROYAL HALL, HARROGATE 27th NOVEMBER 1968

The R.S.P.B. in conjunction with Harrogate and District Naturalists' Society will be showing new films in a programme at the Royal Hall on 27th November. The programme includes 'Sea Swallows', 'Operation Osprey', 'After the Torrey Canyon', and 'The Snowy Owls of Shetland'. Tickets 5/- (3/- for children) obtainable from the Royal Hall or from Miss M. Sanderson, 51 Lancaster Park Road, Harrogate.

There will be a sales counter and mobile display unit depicting the work of the R.S.P.B. at the film show.

Will members please make this as widely known as possible.

Y.N.U. NEWSLETTER

The Y.N.U. Newsletter, sent to all Full members and Affiliated Societies, is published three times a year: February, May and November. Its aim is to provide a means of intercommunication between all members by giving, for example, reports on Y.N.U. and Society meetings and activities, items of broad Natural History interest, details of all types of surveys and enquiries. All items should be sent to the Newsletter Editor: Mr. H. T. James, 238 Sigston Road, Beverley, Yorks.

FIELD BIOLOGY

The University of London awards a Certificate in Field Biology which is available to all persons interested in the study of living things in their natural habitats. The work involves a directed course of private reading at home, attendance at two Practical Courses each of two weeks held in the Summer of consecutive years, an approved plan of field-work suited to the student's locality to be written up in the form of an essay, and examinations.

The next Practical Course for new students will take place at the Orielton Field Centre, near Pembroke, from 6-20th August 1969. As accommodation is strictly limited early application is advisable.

The regulations and application form may be obtained from the Assistant Director (Room 14), Department of Extra-Mural Studies, University of London, 7 Ridgmount Street, London, W.C.1.

CYPRIPEDIUM CALCEOLUS L. in LITTONDALE

C. A. WILLOUGHBY

Littondale is a typical U-shaped glacial valley in Wharfedale, about nine miles long, with the Great Scar limestone forming the valley floor from Arncliffe to Foxup and rising in high scars at Hawskwick and Arncliffe. It is drained by the River Scirfare which joins the Wharfe at Amerdale Dub.

The first reference to *Cypripedium calceolus* L. in Littondale, is in the herbarium of John Dalton, originally in the possession of the Manchester Literary and Philosophical Society, but unfortunately destroyed in the bombing during World War II. Happily, a good account of the herbarium and plant list was written by Adamson and Crabtree (1918). In this, reference is made to "*Cypripedium calceolus*. Ladies' slipper. From the marshes about Arncliffe-in-Craven. Presented to me by Nancy Wilson of Thornton-in-Craven. V.14". Exception has been taken to this record on two grounds. Firstly it is undated, although this volume of the herbarium contained most of his Manchester records which were seemingly collected prior to 1797. It should be noted, however, that the specimen was presented to him and not collected personally. Secondly, the habitat is unlikely; *Cypripedium calceolus* is well known for being an inhabitant (in England) of tree-shaded limestone scree-slopes, it has never been found in marshy areas. There is a herbarium specimen in J. Dalton's collection at the Museum of the Yorkshire Philosophical Society labelled "From Grassington Wood, 1797". The two herbaria, however, were quite distinct. The Manchester herbarium was that of John Dalton the chemist (1766-1844) the Yorkshire herbarium belonged to the Rev. James Dalton (1764-1843).

The next reference to it is by John Windsor (1857, 1873), a Manchester surgeon (1787-1868), who, in an article on "Plants near Settle" mentions it as being found "in the narrow wood called East Field Wood and the adjoining ones near Arncliffe. About the year 1804 or 1805 a few specimens of this rare and beautiful plant were pointed out to me in this locality, by a relative of my own, Miss Petty, of Arncliffe". Windsor was too competent a botanist for this record to be suspect despite the fact that it was published more than fifty years after he had the plants pointed out to him.

Eleven years elapse before any other specimen is recorded, when in 1816 *Cypripedium calceolus* was gathered on Arncliffe Cloulder by W. Shepherd, and seventeen years later in 1833 it was recorded by J. Tatham (1793-1875) the Settle botanist "below a tree of *Pyrus aria*" (Miall and Carrington, 1862).

From now on the pace of collecting seems to accelerate and about 1835 it was discovered by J. Just (1797-1852), later to become the Professor of Botany in the Manchester Institution. Two plants in bloom were found and five small seedlings. Two flowers were taken and on becoming known the plant was "sought out by gardeners from the neighbourhood of Manchester and rooted up" (Cash, 1873). J. Just commendably deplored this but managed to gather another specimen in 1842 now in the herbarium of the Butler Museum, Harrow School.

A significant event in the history of *Cypripedium calceolus* around Arncliffe took place in 1835 when the Rev. William Boyd was appointed to the living of Arncliffe and Halton Gill. In 1847 he "sent Mr. Tatham a specimen of a really wild *Cypripedium calceolus* found this summer by one of his pupils" (herb. BIRA). In the herbarium of the British Museum there is another specimen ex herb. J. Tatham from Arncliffe Clouders, collected at the same time. 1850 saw two specimens obtained by Boyd on 31st May, one is in herb. J. W. White (BRIST), the history of the other (herb. GL) is not known. In Lees' *Flora of West Yorkshire* (1888) appears the entry "East Field Wood, 1860; James Ward, spn. in herb. Lees; Id., spn., 1867; herb. G. E. Smith". Neither of these specimens can now be traced but one would assume that the 1860 specimen at one time formed part of Lees' own herbarium. It is not at the Cartwright Hall, Bradford, nor in that part of his collection which is at the British Museum. G. E. Smith's herbarium is now at the Royal Botanic Gardens, Kew, but again, there is no specimen collected in 1867 by James Ward.

In 1869 a specimen was gathered by Miss Julia Boyd (herb. HAMU) and from then until 1878 reference to the species is confusing. In the latter year a specimen was taken in "the first week of June, per Miss Wheatley" (herb. Whitwell, BIRA). In a written comment accompanying the specimen Whitwell states "Undoubtedly taken from the Rev. Canon Boyd's garden at Arncliffe, though given to me as wild. I have corresponded with the Canon Jan. 1887". There is no record of any reply by the Canon.

The orchid was reported as having disappeared from the woods on the south side of Littondale by 1891 (Hobkirk & Lee) but the Rev. W. A. Shuffrey verifies its presence in "Lower Arndale" in 1901. In 1904 he again reports it in the Arncliffe vicinity but noted also that attempts had been made to dig it up. In 1905 it was collected by S. H. Bickham on 4th June (herb. CGE) and the last wild specimen seems to have been taken out of Littondale on 12th July 1914 by G. Walworth (herb. UCNW).

It would not be right to mention *Cypripedium calceolus* and Littondale without referring to its culture in gardens in that area. The first reference to its being in cultivation is by Whitwell writing of the specimen "undoubtedly taken from the Rev. Canon Boyd's garden" in 1878 (herb. BIRA). Canon Boyd took up the living in 1835 and there is reference (Ward, 1858) to his intensive horticultural activities in 1858. It is possible that the orchid was in his garden by then, or even before. In 1891 there is further reference (Hobkirk & Lee, 1891) to *Cypripedium calceolus*, "still growing in a garden in the dale". This may well support J. F. Pickard (herb. LDS) who suggests that it was still in the vicarage garden in 1902 but had died out by 1906. He gives the date of introduction into that garden as "1875 or 80".

It is, however, the plant which was taken into the Falcon Inn which gives a good picture of the orchid under cultivation. It is thought that the plant was first put there sometime between 1918-20. The origin of this plant is obscure. It has been said that Canon Shuffrey planted the orchid at The Falcon Inn and that the original plant came from Kettlewell. Canon Shuffrey, however, departed from Arncliffe in 1916. According to J. F. Pickard it was "transplanted as a large healthy plant" (note in herb. BIRM 1932) and this suggests that it was done by someone in the immediate vicinity. Another version is that the plant was gathered at Arncliffe by W. H. Stansfield, taken to Southport where it failed to flourish and then eventually brought back to Arncliffe in a moribund condition and planted at The Falcon Inn (Frankland, 1966). Strangely enough in *The Naturalist* (1922) appears the following, taken from a local newspaper: "Mr. W. H. Stansfield . . . understands that Mrs. Miller, hostess at The Falcon hotel still has a fine specimen of this rare and beautiful plant." If he himself had placed it there, one would have expected him to be more explicit about its presence.

In 1925 it had about 13 blooms according to J. F. Pickard and again in this year C. B. Tahourdin in his *Native Orchids of Britain* is "indebted to Mr. M. Miller and Mr. H. W. Burge for the specimen of *Cypripedium calceolus*".

It is again mentioned in July 1926 when leaves only were obtained (herb. Reynolds, BOR). On 16th July 1928 three specimens were collected (herb. Frankland & herb. Holder LIV). The orchid was probably flowering again in 1929. John Crowther in *Silva Gars* mentions *Cypripedium* "flowering in a garden at Arncliffe"; ten strong healthy plants (? stems) were in bloom and he learned from the owners that they had grown it from a specimen collected in a wood at Kettlewell.

A specimen in herb. Brit. Mus., ex herb. Thos. J. Foggitt from "Arncliffe, Littondale, 11th June 1930" is labelled as being from a garden and was very likely from The Falcon Inn. In 1932 a specimen was obtained in early June by J. F. Pickard — "one of seven blooms ten heads" (? stems) (note in herb. BIRM, 1932). He also indicates its origin prior to being brought into cultivation as Arncliffe. The last reference to *Cypripedium* in the garden of The Falcon Inn is on 2nd-9th June 1934, when the Alpine Garden Society (Anon. 1934) visited this hotel and saw the orchid with seven flowering spikes.

The ultimate fate of the plant is not known except that one year there were eighteen flowers, four of them in pairs on two stems. After this effort the plant seemed to degenerate and finally disappeared. Whether it died naturally or was taken by a collector is not known. The production of eighteen blooms was mentioned in a note by Pickard on the specimen taken in 1932 (BIRM). In the same note he also suggests that the production of a large number of flowers may be followed by a season in which only leaves are produced. That happened with this particular plant.

The main reasons for the gradual disappearance of *Cypripedium calceolus* from Littondale can be put down, very probably, to the natural hazards to which the orchid is prone, sheep grazing, cattle trampling, slug and rabbit damage but, by and large, the greatest cause of the decline in numbers is the collector — whether by intent as in the case of the botanist, or accidental collection due to lack of knowledge on the part of lay people. To mention a few examples — the habitat in which it was found by Just in 1835 was "sought out by gardeners from Manchester and the plant rooted up" (Cash, 1873). There is also the story told by Boyd of the enthusiastic Professor of Botany who offered a guinea for a "root". In the absence of the vicar one year in the

early summer it was "uprooted ruthlessly" (Boyd & Shuffrey, 1893). The Canon himself however, seems to be not without blame in this respect. He ensured that the orchid did not seed, because every year, on the first appearance of the bloom, it was carefully cut off. It is interesting to speculate on the fate of these flowers when removed. If mature — one might think more should be preserved in herbaria. One can only assume that they were cut off very young or not many blooms were found to be cut off. A correspondent in the *Yorkshire Post* (Anon. 1906) said of Archdeacon Boyd "fearful of its (*Cypripedium calceolus*) total extermination he transferred all specimens he could hear of to the vicarage garden". He did contemplate trying to transplant specimens from his garden to the environs of Arncliffe but "the dread of ruthless botanists with empty baskets" acted as a very salutary deterrent (Boyd & Shuffrey, 1893).

ACKNOWLEDGEMENTS

I would like to thank the numerous museum directors, keepers of herbaria and correspondents who have been most co-operative in the preparation of this paper.

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SOME INTERESTING RECORDS OF FLAT-FLIES

(DIPTERA: HIPPOBOSCIDAE)

FROM HIRUNDINIDAE & APODIDAE

GORDON B. THOMPSON AND HARRY E. BEAUMONT

Thompson (1947 & 1953) drew attention to the fact that many of the old records of *Stenopteryx hirundinis* (L.) from Hirundinidae other than the specific host, *Delichon urbica* (L.) (House Martin), may well have been incorrect because the hosts were incorrectly identified. A few records of *S. hirundinis* and *Ornithomya* spp. from Hirundinidae are, however, quite authentic (see Thompson, 1953, 422-3). The Hirundinidae are represented in the United Kingdom by *Hirundo rustica* (L.) (Swallow), *D. urbica* (L.) and *Riparia riparia* (L.) (Sand Martin) and the Apodidae by *Apus apus* (L.) (Swift). Oldroyd (1966) said "Rather surprisingly and contrary to many records neither [*C. pallida* nor *S. hirundinis*] is a common parasite of the Swallow though a few authentic records exist (including one that came to my notice recently) of *Stenopteryx* on that host". This statement revived the interest of one of us (G.B.T.) in the occurrence of these host-specific parasites on other hosts and following some correspondence with Mr. H. Oldroyd, to whom we are very grateful, details were provided of these records. One of them had been provided by H.E.B. and as a result of correspondence we thought it worthwhile publishing our records.

The following records, with three exceptions, are unpublished and based mainly on material in our collections. In the case of specimens collected by others, every attempt has been made to verify the circumstances of the captures and the identification of the hosts can be taken as correct.

Ornithomya avicularia L.

1. 1♀, *H. rustica* (Swallow – juv.), Yorks., Doncaster, Adwick-le-Street, 4.viii.1963 (*H.E.B.*). The host was caught along with other bird species, placed in a separate bag immediately and the fly collected later.
2. 1♀, *H. rustica* (Swallow – juv.), Yorks., Doncaster, Low Ellors Carr, 18.vii.1965 (*R. Moat*). This specimen was taken from a Swallow caught at a roost, the few other bird species were bagged separately.
3. 1♂, *H. rustica* (Swallow – juv.), Yorks., Knaresborough, 30.vii.1967 (*J. R. Mather*). An authentic record.
4. 1♀, *D. urbica* (House Martin – juv.), Yorks., Barnsley, Wombwell, Lundhill, 15.vii.1967 (*J. W. Hartley*). The host was mist-netted at a small sewage works and the fly was collected from the bird at the time of handling.

O. chloropus Bergroth.

5. 1♂, *H. rustica* (Swallow), Yorks., Spurn, 19.v.1966 (*B. R. Spence*). The host, along with other Swallows, was considered by Mr. B. R. Spence to have overshot its breeding area on spring migration and to be returning south when trapped, a theory which was strengthened by the recovery of some of the Swallows further south in June and July of the same year. Whether the fly was acquired on the Continent, carried north then south to Spurn or whether it was acquired north and carried south is a matter of conjecture, in any case the date is very early. This particular bird was collected on its own.
6. 1♂, *R. riparia* (Sand Martin – ad.), Yorks., Skipton, Appletreewick, 26.vi.1966 (*H.E.B.*). This fly was the only specimen collected at a Sand Martin colony but two others were seen to leave adult birds on the same date and on 3.vii.1966 single flies were seen to leave 2 juvenile and one 'un-aged' Sand Martins.

O. fringillina Curtis.

7. 1♀, *H. rustica* (Swallow – juv.), Yorks., Mexborough, Old Denaby, 5.ix.1966 (*H.E.B.*).
8. 1♀, *H. rustica* (Swallow – juv.), Yorks., Doncaster, Sprotborough, 3.viii.1967 (*H.E.B.*).
9. 1♀, *H. rustica* (Swallow – juv.), Yorks., Mexborough, Old Denaby, 10.viii.1967 (*H.E.B.*).
No. 7 was collected from a bird at a roost where no other bird species were present. Nos. 8 & 9 were taken from catches consisting only of Swallows but Sand Martins and Warblers were also present at Sprotborough and Sand Martins were also present at Old Denaby.
10. 1♂, *R. riparia* (Sand Martin), Leics., Rothley, 7.viii.1960 (*C. T. Beverley*). This is the specimen referred to by Oldroyd (1966). The data are 'with three others on various dates from Sand Martins'. Mr. C. T. Beverley (*in litt.*) tells us he has taken several flies at a breeding colony in a dry sand pit at Rothley from Sand Martins and the specimen referred to above was taken from an adult ♂ bird caught in a mist-net sometime between 7.00 – 9.00 p.m.

S. hirundinis L.

11. 1♂, *R. riparia* (Sand Martin), Yorks., Knaresborough, 19.vi.1966 (*D. M. Burn*). This record has been published in Rep. Knaresborough Bird Ringing Station (1966), 1967, 7, by the collector (*D.M.B.*).
12. 1♀, *R. riparia* (Sand Martin – ad.), Suffolk, nr. Bury St. Edmunds, Timworth Hall, 15.vii.1967 (*G.B.T.*).
13. 1♀, *R. riparia* (Sand Martin – ad.), Suffolk, nr. Bury St. Edmunds, Timworth Hall, 15.vii.1967 (*G.B.T.*).
These two flies were the only ones taken from birds caught in mist-nets at a

Sand Martin colony. A total of 253 adults and 132 juveniles was examined. At least two other flies were seen.

14. 1♂, *R. riparia* (Sand Martin - ad.), Herts., Rye Meads, 30.v.1965.
15. 1♂, *R. riparia* (Sand Martin - juv.), Herts., Rye Meads, 21.viii.1965.
16. 1♂, *R. riparia* (Sand Martin - juv.), Herts., Rye Meads, 3.viii.1966.
17. 1♂, *R. riparia* (Sand Martin - juv.), Herts., Rye Meads, 5.viii.1966.
18. 1♂, *R. riparia* (Sand Martin - juv.), Herts., Rye Meads, 24.viii.1966.

Records 14 & 15 have recently been published (Lloyd-Evans, 1967) and nos. 16, 17 & 18 have been kindly supplied by Dr. L. Lloyd-Evans, Secretary, Rye Meads Ringing Group, who tells us (*in litt.* 16.i.1968), "On one occasion only, 30.v.1965, House Martins were also caught and handled, but on that day the infested Sand Martin was caught and de-loused an hour before the first House Martin and in all cases precautions were taken against straggling.

C. pallida Latr.

19. — *H. rustica* (Swallow), Yorks., nr. Rotherham, Micklebring, 3.vii.1963 (*R. Bramhill*). This specimen was also referred to by Oldroyd (1966) and we are certain of its authenticity.

Since the publication of Thompson's summary of the records of Hippoboscidae from Hirundinidae (1953) and the Bibliography (1955) some additional records have been noted. Thompson (1952) recorded 2♂♂, *O. fringillina*, Swallow - nestling, Lincs., Gibraltar Point, 7.vii.1950. Bequaert (1953) referred to a specimen of *S. hirundinis* from Sand Martin, Suffolk (*R. Meinertzhagen*) but we have no further details. The identifications of both fly and bird can be accepted. Hill (1962a) listed one record of *O. avicularia* from House Martin, two records of *O. chloropus* (= *O. lagopodis* Sharp) from Swallow but gave no details. These records may be based on some of those referred to by Thompson (1953).

Beaumont (1965, p.100) listed a record of *S. hirundinis* from 'Swallow, 1935, Kexborough'. This is Bayford's (1908) record of an addition to the list of Yorkshire Diptera. The late C. A. Cheetham (*in litt.*, 10.v.1950) gave details of this record — '*Stenopteryx* (sic) *hirundinis* L. — Kexbro' (Doncaster), on young Swallows in school grounds (*G. H. Sutton*)', which is as he recorded it in 1936. Unfortunately Beaumont incorrectly assumed the date of collection was in 1935 because it was listed by Cheetham (1936) in the Annual Report for 1935. The specimen cannot be found in Bayford's collection which was donated to Barnsley Corporation and it seems safe to accept the identification of the fly but not that of the bird.

In view of the host specificity of *S. hirundinis* it is safe to assume its occurrence on other species of birds is accidental. The House Martin and the Swallow build their nests under eaves, etc. and in cowsheds, outbuildings, etc., respectively. There is little competition for nesting sites and apart from feeding together there is very little relationship between them, although there are records of them nesting in close proximity. It is not surprising therefore that we know of no records of *S. hirundinis* from Swallow. Ecologically it seems unlikely that a transfer of parasites could occur at any stage in their life histories. On the other hand we list the Sand Martin as host of *S. hirundinis* on nine occasions. These can probably be explained by the fact that House Martins occasionally enter Sand Martins holes and sometimes remain in them overnight. However, Chris Mead, who has ringed thousands of Sand Martins at their nesting sites, tells me he has only noted one House Martin in three to five thousand Sand Martins coming out of holes. Additionally, there are isolated reports of attempted coition between House Martins and Sand Martins.

In the case of the *Ornithomya* spp., host specificity is not marked but they each have a number of preferred hosts or breeding hosts upon which they seem to feed and reproduce. The relatively few records of their occurrence on Hirundinidae indicates these are also accidental. The nests of House Martins and Swallows are frequently appropriated by House Sparrows which are an integral part of the community in which they live. Tree Sparrows have been known to nest in Sand Martins holes and occasionally House Sparrows when the holes are in close proximity to buildings, etc. Some Starlings also nest within similar areas, in sites shared by Swallows, House Martins and House Sparrows, and in autumn, particularly at sewage works, Starlings are often seen sitting on overhead wires in company with

Hirundinidae. *Ornithomya* spp. are commonly found on Starlings, House Sparrows and Tree Sparrows and there is therefore ample opportunity for their transfer to Hirundinidae especially since they are able to fly.

The occurrence of *C. pallida*, the specific parasite of the Swift, on a Swallow may be explained by the occasional proximity of their nests because these flies frequently stray from their true hosts' nests. Keymer, Rose, Beesley & Davies (1962) recorded two specimens of *S. hirundinis* from a Swift captured in a weak condition, near Weybridge, Surrey. This may well be another instance of the fly straying from a nearby nest. There are probably simple explanations of all these unusual occurrences but until they present themselves the possibilities mentioned above may explain them in part.

NOTE.—Hill (1962b) stated "*O. biloba* Dufour, 1827, which is common on the Continent on hirundines, is an occasional visitor to Britain. This fly is a common parasite of Swallows and occasionally occurs on House Martins and Sand Martins on the Continent according to Theodor and Oldroyd (1964). Dr. L. Lloyd-Evans (1967) has recently published the first record of this fly from Britain — a single specimen (sex not stated), from Swallow, ad. ♀, Herts., Rye Meads, 6.vi.1964. The host was one in 'a considerable movement of hirundines at Rye Meads on that day and the host Swallow had probably just arrived from the Continent'.

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Social and Natural Biology: Selections from Contemporary Classics edited by Cecil E. Johnson. Pp. viii + 272. Van Nostrand. 28/-.

This book brings together excerpts from the writings of authors of distinction. It contains nineteen extracts from fourteen authors, amongst them being Aldous Huxley, John Steinbeck, Rachel Carson, Konrad Lorenz, Thoreau and Tinbergen. The selections are arranged under three themes. Those on Evolution, Eugenics and Population Perspectives place the emphasis on human population dynamics. The second section includes essays on natural history and the final section has four essays on Animal Behaviour. It is unlikely that all will be read with equal interest and enjoyment but it is equally unlikely that several will not give great pleasure and perhaps lead the reader to further enjoyment of the authors of his choice.

W.A.S.

MARINE FISHES AT SCARBOROUGH DURING 1967

D. E. WHITTAKER

For the past twenty years, the marine fishes inhabiting the waters off the Yorkshire coast have been greatly neglected, and there have been no serious workers on this aspect of the Natural History of our area since the days of W. J. Clarke. One new addition was made to the Yorkshire list in 1967, and some very rare visitors to these waters were obtained.

The first of these rare visitors was obtained on 24th August, following a message from the Beach Inspector that a 'queer fish' had been found in the North Bay. On arriving at the North Bay, we found the beach thronging with visitors and a large crowd gathered around the 'queer fish' that had been dragged the length of the beach to a grass slope on the foreshore. The fish was a specimen of one of the remarkable Trachypteridae or Ribbon fishes, which are usually and then only rarely, encountered in or adjacent to areas of deep water, the normal swimming depth being in the twilight zone at about 200–300 fathoms of water. Our specimen was the Dealfish, *Trachypterus arcticus* Brunn, normally found in the cold waters to the north of the British Isles and certainly extremely rare so far south in the North Sea. We have in fact only one previous record, for a specimen captured in 10 feet of water in Filey Bay, in June 1964. Because of the rarity of this species it has now been skinned and will in due course be mounted for the fish collection at Scarborough. The fish was discovered in three feet of water, and in order to land it upon the beach, local Life-guards placed a thick rope around the root of the tail which was soon severed from the body and lost upon the crowded beach, while the rest of the fish was dragged up onto the grass slope. In length the specimen is 6 feet 4 inches, and when complete it would probably have been about 7 feet 2 inches long to the tip of the caudal fin. Further damage occurred to the specimen when a Life-guard, not realising the importance of the capture, almost cut the body into three parts after deciding that the middle section would be good to eat. Fortunately he was stopped before his knife had done irreparable damage. The Dealfish is a wonderful sight when fresh from the sea, being of a glossy aluminium colour, with darker shades upon the head and smokey patches on the anterior portion of the body, which is studded with very low, rounded tubercles. The dorsal and pectoral fins are bright crimson but in the adult stage these fishes lack any pelvic fins, the Scarborough specimen possessing two small furrows about $\frac{3}{4}$ " long, one on either side of the body on the ventral margin, showing the sites of origin of the pelvic fins when in its juvenile stage. The Scarborough specimen was a mature female, with an ovary 28.5 inches long and containing ova almost 0.2 inches in diameter.

The Dealfish belongs to the Order Allotrignathi, a small group of fishes characterised by the unique buccal mechanism that enables the members of this Order to obtain food. The mouth is constructed in the form of a collapsible extension that can be rapidly shot out towards the prey, which generally consists of small pelagic fishes and crustaceans, and the result of this action is to cause a suction of the victim, together with a little water, into the mouth and hence the victim is secured in an instant. The head of the Scarborough Dealfish is in perfect condition and this has enabled me to prepare the accompanying sketches. Because of this device and the fact that the prey is quickly swallowed, there is no real use for teeth, and hence the members of the Allotrignathi have very feeble dentition, the Scarborough specimen being a good example of this. The teeth are distributed 1:5 on the upper mandible and 6:6 on the lower, and all are sharp, backwardly pointing and of irregular size. The large eye of this specimen was margined in crimson with outer margins of gold and finally black. The ovate pupil was large and positioned obliquely across the iris, the latter being whitish with golden and smokey coloured iridescences. The following are additional particulars:

BODY

Total body length (excluding tail root and caudal fin) 78 inches.

Greatest body depth 16 inches at 27.5 inches from the snout.

Anus 44.5 inches from snout.

Centre of eye (2.6 inches in diameter) 5.1 inches from snout.

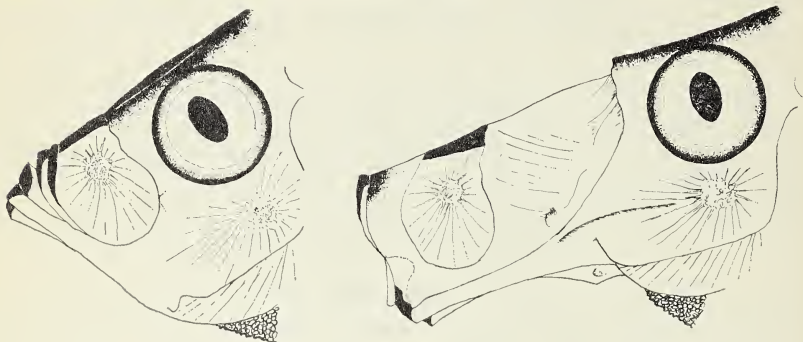
Lateral line commences 0.8 inches above and behind eye and remains central and parallel to the dorsal margin of the body, until the posterior end of the body is reached, where it dips slightly and curves up to the root of the caudal fin. The lateral line

armed with low, forwardly pointing spines which at the centre of the body are at a constant spacing of one inch.

FINS

Pectoral fins originate 10.6 inches from snout and consist of 10 rays, of which the 5th is the longest (3.2 inches); colour pink.

Dorsal fin of 155 rays (several others are missing) and with a maximum height of 6 inches; colour crimson.



Arctic Deal fish, *Trachypterus arcticus* Brunn.

Head with mouth mechanism in normal retracted position (left) and extended (right)

On 27th September, the first of a series of Ray's Sea Bream, *Brama raii* (Bloch), was trawled off Scarborough. Subsequent to this date, a further 14 specimens have been taken at Scarborough, of which 12 have been preserved in the Museum. Many other specimens have occurred, not only on the Yorkshire coast but on the greater part of the east coast south to Norfolk. The dates of capture, weights and lengths of the Scarborough specimens are shown below. An additional four specimens were taken to the north of Scarborough (personal communication from Dr. J. S. Gray, Wellcome Marine Laboratory, Robin Hood's Bay), viz.: one from Staithes, one from Sandsend and two from Whitby, all taken during the second week of November.

- *27 September One trawled off Scarborough and slightly damaged. Weight 3 lb. 4 oz., total length 21.3".
- *17 October One stranded in the South Bay, Scarborough and very much mutilated by gulls. Weight undeterminable, total length 22.0".
- *25 October One stranded in the South Bay. Weight 6 lb. 4 oz., total length 22.7".
- *8 November One stranded at Scalby Ness. Weight 5 lb. 6 oz., total length 21.7".
- *10 November One trawled off Scarborough. Weight 4 lb. 12 oz., total length 21.5".
- *11 November One stranded at Scalby Ness. Weight 5 lb. 7 oz., total length 23.3".
- *13 November One caught on rod and line at Jackson's Bay, two miles north of Scarborough. Weight 5 lb. 2 oz., total length 23".
- 14 November One trawled by the keel-boat *Onward Star* but thrown overboard. The skipper and his crew had never seen a specimen before, and had only recognised the fish as a Ray's Sea Bream after seeing a photograph of one of the above specimens in the local newspaper.
- *16 November Two specimens, both stranded in the South Bay. One of these preserved in the Museum is 23.0" long and 5 lb. 2 oz. in weight. The second specimen, 21" long, is now preserved in a school at Filey.
- *20 November One stranded in the South Bay. Weight 5 lb., total length 23".
- 24 November One stranded in the North Bay, but in a very mutilated condition, and hence this specimen was not retained.
- *28 November One stranded in the North Bay, weight 4 lb. 4 oz., total length 21.3".
- *30 November One stranded in the North Bay. Weight 4 lb. 8 oz., total length 22".
- *11 December Trawled off Scarborough. This specimen escaped my notice at the Fish Market but was found later in a local shop. Weight 5 lb. 4 oz., total length 23.3".

Those specimens marked with an asterisk are now preserved in the Museum.

The last very large influx of this species into our area was in 1928, when it was reported in *The Naturalist* for that year by W. J. Clarke. The reason for the 1967 invasion is rather obscure, but is probably due to an abnormally large influx of Atlantic water into the North Sea during 1967. Dr. A. Wheeler of the British Museum, informs me that *Brama raii* has been taken all along the east coast from Scottish waters to Norfolk and this, together with the recording of several other *Trachypterus* and two turtles of the genus *Dermochelys* in the North Sea, shows that the influx was made from the north. It is interesting to note that W. J. Clarke failed to find any remains of food in the stomachs of the Ray's Breams that he examined. I have examined the stomachs of all those preserved at Scarborough and have met with practically the same result, only two of the twelve specimens yielding any stomach contents. These consisted of two almost completely digested fishes, about 3-4" long, of which only the vertebral columns remained, and they were found in the specimens of 13th and 16th November (caught on rod and line in Jackson's Bay and stranded in the South Bay after rough seas, respectively).

Other evidence of the abnormal influx of Atlantic water into the North Sea is shown by the capture of a specimen of a flying fish, *Cypselurus lineatus* (C. & V.) by a herring drifter operating off the east coast in late September. It was only by an unusual stroke of luck that this specimen came into my possession, since none of the fishermen or mongers who had seen it realised that it was a flying fish, or in fact an unusual fish! As far as I am aware, the only previous record for a flying fish on the Yorkshire coast is the specimen found upon the beach at Whitby in 1894 and noted by Thomas Stephenson in *The Naturalist* 285, 1894. This specimen is at present being examined by Dr. A. Wheeler, and may prove to be new to the British List. The measurements of the second specimen are as follows:

Total length (from the lip to tip of caudal fin)	16.5 inches.
Total span of pectoral fins when outstretched	19.25 inches.
Length of each pectoral fin	8.75 inches.
Length of each ventral fin	3.4 inches.
Dorsal fin: height 1.65 inches, basal length 2.0 inches.	
Anal fin: greatest height 0.7 inches, basal length 1.4 inches.	
Caudal fin: length of upper lobe 2.5 inches, lower lobe 3.25 inches.	

Another southern species that has been brought into Yorkshire waters is the Black Sea Bream or Old Wife, *Cantharus lineatus* (Mart.), last recorded for Yorkshire in 1936, previous to which there are only five or six other records, viz.: one or two caught off Speeton about 1870, and noted in the *Handbook of Yorkshire Vertebrata*; two in December 1910, one on 26th January 1932, one 1st October 1934, one 27th October 1936, all trawled off Scarborough and noted by W. J. Clarke. During November and December 1967 five examples of this species were caught:

- One trawled ten miles E.N.E. of Scarborough by the *Progressive* on 11th Nov.
- One trawled on 20th November by the *Our Margaret*.
- One trawled on or about 23rd November.
- One trawled by the *Hyperion* on 24th November.

The last specimen was kept alive for me by the crew and when lifted from the water exhibited a brilliant pink reflection which had not been seen in the other, dead specimens. These four specimens are the only examples I have seen and all have now been preserved, but doubtless several others have been landed and have escaped my notice, since I was informed by a local fishmonger that he had had a specimen in his shop sometime during the first week in December, but that he had later thrown it away. The Black Sea Bream is not uncommon on our south and south-west coasts, but its occurrence as far north as this, and on the east coast, is very unusual.

On 19th December, the *F. & S. Colling* trawled a small fish about five inches long which, in the bad light of the fish pier and with my interest more in some invertebrates that had also been trawled that day, I took to be a Viviparous Blenny. The next day the fish was dead and I decided to preserve the specimen, but on lifting it up for closer inspection, I noticed that it was not a Viviparous Blenny but a near and supposedly quite rare relative known as the Crested or Yarrell's Blenny, *Chirolophis galerita* Linn. This little fish is stated by W. J. Clarke to be very rare, but this I think is an exaggeration. The chief identification feature of the Yarrell's Blenny lies in the presence of four soft processes upon the head. If the fish is examined out of water, these processes lie close to the head and are difficult to detect and hence there is a

risk of the specimen being passed off as a Viviparous Blenny. Doubtless this has happened to specimens found on the coast in years past.

Three days after the capture of the above, the *F. & S. Colling* brought me another small fish, the Four Horned Cottus, *Cottus quadricornis* Linn. This species is certainly not common and we have only four previous records from Scarborough; in February 1905 and 1908, September 1926 and January 1928.

Other notable fishes recorded during 1967 are:

Three-spined Stickleback (Gasterosteus aculeatus L.)

One specimen was found in a rock-pool in Burniston Bay on 3rd July. This specimen could have been washed into the area from the rivers and streams entering the sea, and which were considerably swollen during the May floods.

Lesser Fork-beard (Raniceps raninus (L.))

A specimen, 11 inches long, was taken in a crab-pot off White Nab on 28th July.

Pogge (Agonus cataphractus (L.))

This species is obviously common off the coast, and I have had specimens on the following dates:

23rd May, one specimen, trawled; 24th November, one specimen from the *F. & S. Colling*; 11th December, one trawled by *Caroline*; 12th December, one trawled by the *Onward Star*; 13th December, one trawled by the *Onward Star*; 14th December, two trawled by the *Onward Star*.

John Dory (Zeus faber Linn.)

This species also appears to be fairly abundant, and I received eight specimens on the following dates:

15th, 20th and 29th November by the *F. & S. Colling*; 30th November by the *Hyperion*; 4th December by the *F. & S. Colling*; 11th and 12th December by the *Progressive*; 18th December by the *Sincere*.

Common or Müllers Topknot (Zeugopterus punctatus (Bloch))

One specimen, 8.7 inches long was trawled by the *Sincere* on 23rd November. This species is widely distributed around the British Isles, but the local fishermen claimed that they had never seen a specimen before.

Lesser Spotted Dogfish (Scyliorhinus caniculus (Linn.))

Two specimens of this species were seen, one on 23rd November trawled by the *F. & S. Colling*, and the second on 13th December by the *Onward Star*.

Common or Red Bream (Pagellus centrodontus (De la Roche))

One specimen was trawled by the *Onward Star* on 1st December, but the majority of the local fishermen did not know the true identity of the fish, some of them calling it a Red Mullet.

Porbeagle Shark (Lamna cornubica (Gmelin))

I know of two specimens of this common Yorkshire species having been landed. One was trawled off Flamborough Head on 28th October by the Bridlington keel-boat *Our Catherine*, and was obtained for the Scarborough Museum. A second specimen was landed at Scarborough by the *Sunningdale* on 20th November and was sold to a Grimsby firm for a rumoured sum of £6. The former specimen is 7 feet 1 $\frac{3}{4}$ inches long and weighed 241 lb.

"Thresher Shark" at Whitby

The report of a Thresher shark (*Alopias vulpes (Gmelin)*) in the *Scarborough Evening News* of 13th September is misleading, and Mr. R. S. Stephen, a Whitby chemist, claims that the creature he saw was certainly not a shark but a cetacean, breaking the water just outside Whitby harbour.

Poor Cod or Power (Gadus minutus Linn)

Although stated by Travis-Jenkins to be common all round the British Isles, the *Handbook of Yorkshire Vertebrata* gives no exact data for this species and after sixty years of observation at Scarborough, W. J. Clarke recorded only two specimens for our area. However, this species is definitely very abundant in our area and local boats land several dozen with every haul of the net, but due to their small size, they are invariably thrown overboard again.

It is worthwhile putting on record the occurrence of two specimens of the Striped-bellied Tunny in the Salmon nets in Filey Bay in the summer of 1965 or 1966. This species, also known as the Bonito (*Thynnus pelamys*, Cuvier and Valenciennes), has only been taken on two previous occasions, at Whitby in 1882 and 1922.

YORKSHIRE NATURALISTS' UNION EXCURSIONS IN 1968

CATTERICK BRIDGE V.C. 65 — 1st to 3rd June

Our first Field Meeting for the year was held at Whitsuntide with Catterick Bridge as a base. On the first day the Swale banks in the Easby Abbey district were examined, on the Sunday the Hornby Castle Estate was visited and on the Monday two different localities on the Swale banks below Catterick Bridge were investigated. Twenty-six members were present for the final tea and Meeting and sixteen Societies were represented. Dr. W. A. Sledge took the Chair. The landowners who had so kindly allowed us to visit their property and Mrs. J. Holloway the Divisional Secretary who had organised the weekend, were formally thanked by Mr. C. Simms.

Landforms (C. Simms): Saturday was spent in the well-wooded Swale valley above Catterick and below Richmond, Sunday in the rolling parkland of Hornby and Monday in the broad vale just below Catterick.

Above Catterick the Swale is deeply incised, exposing evidence of past glacial action and present scour; especially the work of the recent severe floods. The Yoredale rocks dip gently upstream and so there is a pattern of platforms and ledges of the more resistant components superimposed on a simple series of river terraces. The steep slopes between the various levels carry much of the woodland, those between the highest terraces are marked by lines of gorse; the higher terraces are arable where well-drained. There was a lot of freshly-deposited silt and cobbles, with a poor microscopic flora and fauna as yet, but richly colonised already by annual plants.

The parkland at Hornby Castle, landscaped but otherwise rather drumlined glacial drift on Millstone Grit and Magnesian Limestone, includes a series of long-established lakes, including a once-famous but now disused duck decoy. Except about the lakes there is little woodland.

Below Catterick the braided Swale quickly widens, loses speed and drops some of its load. Regularly accreting floodsilt at Hollow Banks showed seasonal burrows of Rabbit and Water-Vole, an interesting adaptation to a habitat periodically flooded. Upstream of the constricting bluffs at Ellerton and Oran the river deposited a very wide spread of sand, gravel, cobbles and larger items during the March floods, and a large acreage of pasture and river scrub was flooded to a depth of several feet. Apart from a rich crop of transported and annual plants the newly-modified habitat was ideal for nesting Oystercatchers, Snipe and Willow Warbler in an otherwise sparse fauna.

Vertebrates (C. Simms): **FISHES**: Little attention was paid to these but Pike and Trout were present in at least one of the Hornby Castle park lakes, Dace and Minnow in the Swale at Catterick.

AMPHIBIANS: Ponds at Catterick had Smooth and Crested Newts. Common Toad larvae were abundant at Hornby although those of the Common Frog were very few.

REPTILES: A Slow Worm was found in felled and recently replanted woodland on the Hornby estate. This and the Common Lizard, in the ha-ha wall at Hornby, were the only reptiles recorded despite good conditions and visits to some favourable areas.

MAMMALS: Hedgehog road casualties and molehills were seen but a Common Shrew was the only species of Insectivore handled. Bats were not investigated. The meeting was a poor one for Carnivores, despite Mrs. Holloway recording an Otter above Catterick a few days before the meeting; a district where this species has since bred. Signs of Badger and of Fox were found, but nothing of the smaller species. The excavations for Cadbury's new premises at Catterick had exposed recent bones of Roe Deer. The Lagomorphs were well represented. Rabbits have already been mentioned and the Brown Hare was seen several times. The Rodents proved difficult to find or trap, and work elsewhere in areas affected by the severe spring floods indicated that most species had not re-established themselves by midsummer. The Wood Mouse (*Apodemus sylvaticus*), Brown Rat, Bank Vole, Water Vole and Field Vole were eventually found; the Rat by Mrs. Holloway and the Bank Vole by Mrs. Duncan. Water Voles were found only once, and their characteristic activities usually leave conspicuous signs.

Ornithology (A. C. M. Duncan): Catterick Bridge is situated on the Swale in the lower part of its valley. This provided habitats of riverside, farmland and parkland. In addition, gravel working produced a man-made environment suitable for waders. An interesting report came to us that Little Ringed Plover were nesting on the gravel pits. Oystercatchers were seen to be nesting there also and Redshank were heard.

Blackheaded and Herring Gulls and a Heron were seen flying up the river and a colony of Sand Martins were nesting in the river bank. Swallows and House Martins were quite abundant and Swifts were also seen. Yellow Wagtails were seen in the meadows adjoining the river and Grey and Pied Wagtails and Dippers were also seen. Tree Sparrows were noted.

In the woods near Easby, Wood Warblers were heard singing, as were Garden, Willow and Grasshopper Warbler, Blackcap and Whitethroat. Reed Bunting, Corn Bunting and Yellowhammer were heard up the riverside.

Hornby Castle was a parkland area providing various habitats. Its lakes gave us waterbirds such as Mute Swan, Mallard, Coot and Sedge Warbler. The plantations held Pheasant. In the park were Goldfinch, Greenfinch, Chaffinch, Bullfinch, whilst Lesser Redpoll were heard chattering overhead. Great, Blue, Coal, and Long Tailed Tits were seen and a Chiffchaff was heard singing.

Jackdaw, Rook and Carrion Crow were recorded during the weekend as was a Kestrel. Five Canada Geese were seen flying over.

A total of 68 birds were recorded during the weekend.

Other species recorded were: Moorhen, Lapwing, Redshank, Common Sandpiper, Curlew, Snipe, Wood Pigeon, Turtle Dove, Cuckoo, Skylark, Great Spotted Woodpecker, Tree Pipit, Meadow Pipit, Wren, Dunnock, Blackcap, Whitethroat, Pied Flycatcher, Redstart, Robin, Blackbird, Song and Mistle Thrush, Linnet, Redpoll, House Sparrow, Starling and Magpie.

Vascular Plants (W. A. Sledge, C. M. Rob and Joan Duncan).

SATURDAY (W.A.S.): The route was down the river from Easby Abbey thence over the railway bridge continuing down stream on the wooded south bank and then over pasture and open ground by the river. Soon after departure *Gagea lutea* (Yellow Star-of-Bethlehem) was seen — or its remains — and one of the stations for *Epipactis leptochila* (Helleborine) was visited but no shoots were yet above ground. *Geranium sylvaticum* (Wood Cranesbill) was in good flower and a notable feature of this outing was the abundance of *Stellaria nemorum* (Wood Stitchwort) which both here and elsewhere in the Richmond area (it was seen again in plenty on Monday) occurs in great quantity. *Cardamine amara* (Large Bitter-cress), *Ranunculus auricomus* (Goldilocks), *Saponaria officinalis* (Soapwort), *Myrrhis odorata* (Sweet Cicely), pistillate plants of *Petasites hybridus* (Butterbur), *Poa nemoralis* (Wood Poa) and *Milium effusum* (Wood Millet) were amongst other species seen.

The most interesting species encountered during the course of the day was *Vicia sylvatica* (Wood Vetch). This was seen by the path in the wood on the south bank of the river. It was recorded by Miss Rob from Park Wood in 1943, probably from a different part of the wood, and the entry in the *Atlas* is doubtless based on this record. The better known locality at Whitfield Gill, Askrigg is however surprisingly omitted from the *Atlas*. *Prunus padus* (Bird Cherry), *Crepis paludosa* (Marsh Hawk's Beard), *Veronica montana* (Wood Speedwell), *Lathraea squamaria* (Toothwort), *Festuca gigantea* (Tall Brome) and *Equisetum telmateia* (Great Horsetail) were other species noted here. The open ground beyond the wood did not yield many species of interest, *Ophioglossum vulgatum* (Adder's Tongue Fern) and *Saxifraga granulata* (Meadow Saxifrage) being the only ones worthy of note.

SUNDAY (C.M.R. and J.D.): The excursion to Hornby Castle Estate provided an opportunity of visiting an area not normally accessible to naturalists and previously unexplored even by local botanists. The ground included parkland, woodland and a lake, and though much of the parkland had been ploughed some interesting terrain was covered and a number of additions to the 10 km. square were made. The most interesting area was the lake in which *Hippuris vulgaris* (Mare's-tail) was abundant with smaller quantities of *Ranunculus trichophyllus* (Water Buttercup) and *Hottonia palustris* (Water Violet). A dozen different sedges were seen here and elsewhere in the park and woodland. The best plant found was *Scrophularia umbrosa* (Shade Figwort). Over 200 species were noted in the course of the day, the following being additions to the 10 km. square 44/29:

Asplenium trichomanes
Polypodium vulgare
Carex lepidocarpa
C. rostrata
Helictotrichon pubescens
Hippuris vulgaris

Lemna trisulca
Listera ovata
Ranunculus trichophyllus
Scrophularia umbrosa
Taraxacum laevigatum
Valeriana officinalis

The following planted species were also noted in the park: *Alnus incana*, *Lonicera xylosteum*, *Mahonia aquifolium*, *Polygonum cuspidatum* and *Vinca major*.

MONDAY (W.A.S.): This excursion took us first to rough open ground on the north bank of the Swale half a mile below Catterick Bridge. Here *Minuartia verna* (Spring Sandwort) was seen in plenty amongst short turf and bare ground. Other low-lying localities for this species in Yoredale, Nidderdale and Wharfedale have been recorded but all appear to be based on isolated plants which have evidently been washed down from higher up the rivers and which have become briefly established in their recorded sites. Such records of casual and temporary occurrences are of little significance in determining permanent distribution. The Catterick locality which is situated at only 150 ft. O.D. and where the plant has been known for more than 20 years is therefore of particular interest.

Other species seen on or about the same ground were *Botrychium lunaria* (Moonwort) one plant, *Saponaria officinalis* (Soapwort), *Cerastium semidecandrum* (Little Mouse-ear Chickweed), *C. arvense* (Field Mouse-ear Chickweed) and *Galium mollugo* (Hedge Bedstraw). Later, the river bank below Catterick village was visited and here in damp shrubby ground and on extensive open disturbed gravelly areas the following were seen: *Cardamine amara* (Large Bitter-cress), *Stellaria nemorum* (Wood Stitchwort), *Hesperis matronalis* (Dame's Violet), *Reseda luteola* (Dyer's Rocket), *Lychnis alba* x *dioica* (Hybrid Campion), *Anthyllis vulneraria* (Kidney Vetch), *Myrrhis odorata* (Sweet Cicely), ♀ *Petasites hybridus* (Butterbur), *Echium vulgare* (Viper's Bugloss) and *Festuca gigantea* (Tall Brome).

Bryophytes (J. Robertson): No bryologists were present on the first two days and the report below covers only those plants found below Catterick Bridge, on the river banks, on the Monday.

In open grassland on the north bank of the Swale about half-a-mile below Catterick Bridge the species seen were *Pseudoscleropodium purum*, *Hypnum cupressiforme*, *Rhytidiadelphus squarrosus*, *Barbula convoluta*, *Thuidium philiberti* and *Racomitrium heterostichum*, and on bare earth round old rabbit burrows *Weissia microstoma*, in fruit.

On an old wall top near here occurred *Racomitrium canescens*, *Tortula muralis*, *Funaria hygrometrica*, *Ceratodon purpureus* var *purpureus*, *Grimmia apocarpa* and *G. pulvinata*.

Further downstream, amongst the stones in the shallower parts of the river grew *Fontinalis antipyretica*, *Cinclidotus fontinaloides* and *Eurhynchium riparioides* and on the banks amongst the shade of old tree roots: *Mnium punctatum*, *M. hornum*, *M. undulatum*, *M. stellare*, *Cratoneuron filicinum*, *Amblystegium serpens*, *Leskea polycarpa*, *Brachythecium rutabulum*, *Drepanocladus uncinatus*, *Eurhynchium praelongum*, *E. swartzii*, *Isoetecium myosuroides* and the hepatics *Pellia epiphylla*, *Conocephalum conicum*, *Lunularia cruciata* and *Calypogeia arguta*.

HACKFALL AND MICKLEY WOODS V.C. 64 — 8th June

Two parties explored this wooded part of the Ure valley, one starting from Mickley and the other from Hackfall. The weather was gloriously sunny and twenty-seven members, representing thirteen Societies, were present. Dr. Sledge took the Chair at the meeting for reports after tea, and Miss Gunningham expressed the thanks of the Union to the landowners who had granted access to their land, and to Miss H. Lefèvre, the Divisional Secretary, who had organised the excursion.

Vascular Plants (W. A. Sledge): The slopes of the River Ure from Mickley upwards to Hackfall are well wooded. Some clearance of trees has been effected at the Mickley end of the woods and here tall undergrowth soon forced the party which started from this end to ascend from the riverside to the track near the top of the slope. Although some evidence of calcareous soils was seen at the crest of this slope nearly all the ground traversed was siliceous as evidenced both by the rocks exposed and the flora.

Soon after leaving Mickley *Pyrola minor* (Wintergreen) and nearly a score of plants of *Neottia nidus-avis* (Bird's-nest Orchid) were seen. *Carex pendula* and *Equisetum telmateia* (Great Horsetail) were also seen here. Other species noted were *Ophioglossum vulgatum* (Adder's Tongue), *Polystichum aculeatum* (Hard Shield-fern), *Cardamine amara* (Large Bittercress), *Myosotis sylvatica* (Wood Forget-me-not), *Scrophularia aquatica* (Water Figwort), *Veronica montana* (Wood Speedwell), *Galium odoratum* (Woodruff) and *Festuca gigantea* (Tall Brome).

Nearer Grewelthorpe the woods have been less subject to interference. Much of the ground flora is indicative of base-deficient soils with Bluebell, Greater Woodrush, Honeysuckle, Male Fern, Lady Fern and Broad Buckler-fern abundant. A notable species here was *Polystichum setiferum* (Soft Shield-fern). Though previously known to occur here I have seen it in only one other station in West Yorkshire. Two other rare species previously recorded from Hackfall, *Carex strigosa* and *Festuca altissima* were also seen. The former, which I first saw at Hackfall in 1924 has only three or four other stations throughout the county. The *Festuca* is unrecorded in the *Atlas* for 44/27, although the entry for 44/37 is an error for this square. Another plant seen in the Grewelthorpe section of the wood, which is also unrecorded in the *Atlas* for this square, was *Menyanthes trifoliata* (Bogbean) which was abundant in a pool at the Mickley end of the wood. Other plants seen included *Ranunculus auricomus* (Goldilocks), *Stellaria nemorum* (Wood Stitchwort), *Geum intermedium* (Hybrid Avens), *Prunus padus* (Bird Cherry), *Myrrhis odorata* (Sweet Cicely), *Crepis paludosa* (Marsh Hawk's-beard), *Lathraea squamaria* (Toothwort) and *Milium effusum* (Wood Millet).

Bryophytes (F. E. Branson): Following the meeting of the Bryological Section at Hackfall on 3rd April 1965, when the area was thoroughly investigated, a list of all the species found appeared in *The Naturalist* 104-5, 1965. Although the route taken on this excursion was almost identical with that of the previous occasion, i.e. from the road down to the river Ure following the path parallel with the stream and parts of the banks of the stream, one hepatic and twelve mosses were added to that list. It is most interesting to compare lists of species found when revisiting an area. One very small species we were pleased to refind was *Zygodon viridissimus* (Dicks.) R. Br. on a branch reaching across the path. I also saw *Dicranum montanum* Hedw. in the original position and in several other places too, some quite large patches of it being on the trunk of a fallen tree stretching over the stream. Mr. Shaw also reported an abundance of *Tetraphis browniana* (Dicks.) Grev. on rocks at the side of the river Ure, another location from that mentioned in the previous report.

Hackfall is interesting historically as it was here that *Cynodontium bruntonii* (Sm.) B. & S. was first gathered in 1801 by W. Brunton (of Ripon), after whom it was named by Bruch and Schimper. Although we had it in mind, we have not been able to refind it.

The new species found are as follows:

HEPATICAEE

Lophocolea heterophylla (Schrad.) Dum., on tree branches.

MUSCI

Hygrohypnum luridum (Hedw.) Jenn. on wet ground by the side of the path;

Barbula spadicea (Mitt.) Braithw. on rocks by the Ure;

Barbula convoluta Hedw. on a wall near Hackfall;

Barbula cylindrica (Tayl.) Schimp. on a tree root near the river Ure;

Bryum pallens Sw. in several places on rocks above the river Ure;

Isothecium myurum Brid. on a fallen tree stretching across the stream. I made a special note in the previous report that this was not seen in Hackfall, but *Isothecium myosuroides* Brid. occurs far more commonly there.

Cinclidotus fontinaloides (Hedw.) P. Beauv. on wet rocks by the river Ure;

Fontinalis squamosa Hedw. on wet rocks by the river Ure;

Fissidens minutulus (F. pusillus, *sensu stricto*) on wet rocks by the river Ure;

Mnium marginatum (With.) D. Beauv. *var. marginatum*, on a rocky ledge above the river Ure;

Pohlia delicatula (Hedw.) Grout, on wet, dripping rocks above the Ure; and

Grimmia apocarpa Hedw. on rocks above the river Ure.

CAYDALE, Near HAWNBY V.C. 62 — 15th and 16th June

The weather for these two days in north-east Yorkshire was excellent throughout. Members met in Helmsley and travelled to Caydale by car each day, spending the Saturday in the vicinity of Caydale Mill and the Sunday in Deep Gill Wood.

At the tea and meeting at the Feathers Hotel, Helmsley, eleven Societies were represented. The Chair was taken by Miss C. M. Rob.

A vote of thanks to Mr. Lawrence the Divisional Secretary and to the landowners who had so kindly given us permission to visit their property, was given by Mrs. J. Graham.

Landforms (C. Simms): This meeting was concerned with the exploration of Caydale and, especially, its northern wooded tributary Deep Gill. The heads of these sinuous, steep-sided valleys clearly suggest a subglacial origin; the characteristically steep valley sides and rather flat, badly drained floors have sheltered and preserved some very interesting plants.

The rock here is mainly calcareous and the upland plateau shows only a thin soil, but soil conditions in Caydale and Deep Gill are clearly more complex except on the steeper slopes. Postglacial rejuvenation, producing a valley-in-valley form below Caydale Mill, has provided a contrast between the lower valley — choked with glacial, alluvial and landslipped valley-side debris which the stream is incompetent to work — and thin limestone pastures on the little-modified subglacial wall and floor surfaces upstream. Generally, the former has very mixed soils with some rather acid flashes and the latter, little-examined during the meeting, basic and more exposed conditions.

Vertebrates (C. Simms): Other contributors were Messrs. Alderson (16th) and Appleby (15th) and, as usual, some valuable records came from the botanical party. The recorder was not resident in the area for the meeting and undertook no trapping. **FISHES.** The Stone Loach and the Minnow were found in Caydale Beck, but Trout and Sticklebacks were not determined as to the species present.

AMPHIBIANS. Common Toad tadpoles were very numerous at Caydale Mill (and preyed on by a Water Shrew) and a single Common Frog was seen in Deep Gill Wood. These were the only records despite very favourable conditions and the frequency of Slow Worms in the area generally.

BIRDS. A good list owed a great deal to R. Appleby's work on 15th. The only raptor seen was a Kestrel, but game birds were frequent (Common Partridge, European Quail and Pheasant all had chicks). Lapwing and Woodcock were the only waders encountered. Most of the other species were seen in Deep Gill Wood: Stock Dove, Woodpigeon, Cuckoo, Nightjar, Swift, Green Woodpecker, Great Spotted Woodpecker, Skylark, Swallow, House Martin, Carrion Crow, Rook, Jackdaw, Great Tit, Blue Tit, Long-tailed Tit, Nuthatch (breeding), Tree-creeper, Wren, Song Thrush, Blackbird, Whinchat, Redstart, Robin, Sedge Warbler, Blackcap (breeding), Garden Warbler, Whitethroat (abundant), Willow Warbler, Spotted Flycatcher, Dunnock, Tree Pipit, *alba* Wagtail, Grey Wagtail, Starling, Greenfinch, Goldfinch, Linnet, Redpoll, Bullfinch, Chaffinch, Yellowhammer, Corn Bunting, Reed Bunting, House Sparrow and Tree Sparrow. R. Appleby remarked (*in litt.*) on the relative scarcity of warblers, except Whitethroat, and the apparent absence of Chiffchaff.

MAMMALS. Hedgehog, Mole, Common Shrew and Water Shrew made up the recorded Insectivores. Carnivores were few, apart from tracks of Badger and Fox. Mrs. and Miss Robertson saw a Weasel and Mrs. Thompson a Stoat. Rabbits were present in a few places and Grey Squirrels in Deep Gill Wood, but the only small rodents named (from corpses) were the Wood Mouse and the Field Vole.

Entomology (R. Crossley): In spite of glorious weather on the Sunday, few insects were in evidence. Collecting was chiefly confined to the area near the stream in Deep Gill and the list of species found is unfortunately a rather meagre one.

The common hover-fly *Xylota segnis* L. was numerous in the vicinity of decaying tree stumps and one such stump was also attracting numbers of the common carrion beetle *Hister striola* Sahlb. The carrion beetle *Oeceoetoma thoracicum* (L.) was taken in the same locality. The common large longhorn beetle *Rhagium mordax* (D.G.) was taken and also two specimens of *Oedemera virescens* L. The latter is a lovely slender green beetle about half an inch long. It is a very rare insect but it is known to occur in these valleys, and this is the only known area for it in the north of England. Miss Robertson handed me a specimen of the brightly attractive beetle *Sermylassa halensis* (L.) which is a rather local insect and worth noting.

The marsh vegetation by the stream, where it was dominated by *Filipendula ulmaria* produced good numbers of a capsid bug very near to *Lygus pratensis* L. As there has recently been a revision of this critical complex the specimens will provide useful material for further study.

A single specimen of the hover-fly *Pyrophaena rosarum* Fab. was interesting. This is a very local species, at least in the north, and this constitutes the first record for V.C. 62.

I am grateful to Mr. J. H. Flint and Mr. P. Skidmore for identifying the beetles, and to Mr. Flint for comments on their distribution.

Flowering Plants (J. Holloway and C. M. Rob): Not only has the Yowlass-Murton valley been visited by the Union twice in the last 50 years, but this particular 10 km. square is probably one of the best worked areas in V.C. 62.

Since the last visit by the Y.N.U. in 1953 there have been a number of changes, the one affecting the flora to a large extent is the afforestation of the lower end of the valley, with the making of wide roads and deepening of the existing streams, and this weekend has shown the need for constant work in areas which, on paper seem to have been well explored and recorded.

Perfect weather added to the enjoyment of the meeting; the ground worked provided a good variety of habitats, acid moorland on the hill tops, scrub, woodland, marshy stream sides, calcareous flushes, rough grazing, forest rides, with a little arable and new ley pasture. A feature of this, along with other nearby limestone valleys, is the trees of *Acer campestre* (Field Maple), which are really big trees in the old woodland, a complete contrast to those more often seen in the lowland hedgerows. Close to Murton Grange farm a very large stand of *Myrrhis odorata* (Sweet Cicely) may well be a relic of the time when this plant was cultivated for use as a cattle spice. *Pinguicula vulgaris* (Butterwort) was very abundant in most of the calcareous marshes as was *Valeriana dioica* (Marsh Valerian) while *Trollius europaeus* (Globe-flower) and *Carex dioica* were noted in at least two places. *Carex lepidocarpa* was in several places near the junction of the Deepgill beck and the main stream; *Melica nutans* and *Aquilegia vulgaris* (Columbine) were seen on the first day when the Caydale Mill area was examined. Here the ground is more open. Lower down most of the woodland was very dense; Deepgill was almost impassable with far too many stinging nettles for comfort. *Geum intermedium* was very plentiful at the low end of Deepgill, along with both *Geum urbanum* (Wood Avens), and *G. rivale* (Water Avens).

Along the newly cut forest road *Veronica officinalis* (Common Speedwell) made a fine show, some clumps being about 3 ft. across and a mass of mauve flower. *Trifolium medium* (Zigzag Clover) was also very abundant, more so in fact than any other species of this genus. New Zealand Willowherb has now arrived in this valley, a fair-sized patch being noted on the first day near the mill.

In all, eight plants were added to the 10 km. square SE 5/9 bringing the total to 548. The additional species are *Ononis repens* (Rest Harrow), *Potentilla anglica* (Tormentil), *Spergula arvensis* (Corn Spurrey), *Salix aurita* (Eared Sallow), *Dactylorhiza maculata* (Spotted Orchid), *Taraxacum palustre*, *Valeriana officinalis* (Common Valerian) and *Epilobium nerterioides* (New Zealand Willowherb).

There is no doubt this valley should be visited by the Union at fairly frequent intervals and a record of the changes published, for although at the present time most of the plants recorded in the past survive, their future is very uncertain.

Bryophytes (J. Robertson): Although conditions were very dry about 60 species of bryophytes were collected, all of them fairly common and typical of their habitats.

On dry, limestone walls in various parts of Caydale occurred quantities of *Grimmia apocarpa* and *G. pulvinata*, *Tortula muralis* and *T. ruralis*, *Camptothecium sericeum*, *Neckera crispa* and *N. complanata*, *Tortella tortuosa*, *Orthotrichum anomalum*, *Funaria hygrometrica* and in one site only, the hepatic, *Frullania tamarisci*.

On bare earth banks beside the road above Caydale Mill *Weissia microstoma* was fruiting profusely in a number of places with *Barbula unguiculata* and on sandy soil between young conifers on the hill top; also *Polytrichum juniperinum*, *Dicranella heteromalla* and *Pleuroidium subulatum*.

On numerous tree boles in Deep Gill grew *Metzgeria furcata*, *Bryum capillare*, *Dicranoweissia cirrata*, *Orthodontium lineare* and *Ceratodon purpureus* var. *purpureus*.

Various limestone exposures on the hillsides supported *Ctenidium molluscum*, *Camptothecium lutescens* and *Diplophyllum albicans*.

Typical open woodland mosses found were *Tetraphis pellucida*, *Mnium hornum*, *M. undulatum*, *M. stellare*, *Plagiothecium undulatum*, *P. succulentum*, *Dicranum scoparium*, *Amblystegium serpens*, *Eurhynchium striatum*, *E. praelongum*, *Isoetecium myosuroides*, *Cirriphyllum piliferum*, *Thuidium tamariscinum*, *Thamnium alopecurum* and the hepatics *Plagiochila asplenoides* var. *major*, *Calypogeia arguta* and *Lophocolea bidentata*.

In the open grassland some common species were: *Rhytidiadelphus squarrosus* and *R. triquetrus*, *Acrocladium cuspidatum*, *Brachythecium rutabulum*, *Pseudoscleropodium purum* and *Pleurozium schreberi*.

In the alkaline Caydale Beck, *Cratoneuron filicinum*, *C. commutatum* and *Conocephalum conicum* occurred frequently.

In the bog just below Caydale Mill, which appeared to have both acid and alkaline flushes, we found *Philonotis calcarea*, *Fissidens adiantoides* and *F. taxifolius*, *Dicranum bonjeanii*, *Climacium dendroides*, *Pohlia nutans*, *Mnium punctatum*, *Acrocladium cordifolium*, *Polytrichum commune* and *Riccardia pinguis*.

BRETTON PARK AND STOCKSMOOR COMMON V.C. 63 6th July

Again in brilliant sunshine members enjoyed a morning in Bretton Hall Park and the afternoon on Stocksmoor Common.

Thirty-seven members, representing fourteen Societies, were present at the meeting for reports after tea, when Mr. R. Atkinson took the Chair. Miss J. Robertson expressed the visitors' thanks to the landowners who had so readily granted us access, to the ladies of the Barnsley Naturalists' Society who had provided the tea and to the Divisional Secretary, Mr. R. Crossley, who had organised the day's programme.

Ornithology (C. Disbrey): The following birds were seen during the day:

BRETTON PARK

Great Crested Grebe, Mallard, Canada Goose, Kestrel, Moorhen, Coot, Lapwing, Lesser Black-backed Gull, Black-headed Gull, Stock Dove, Wood Pigeon, Turtle Dove, Swift, Skylark, Swallow, House Martin, Sand Martin, Carrion Crow, Rook, Jackdaw, Magpie, Jay, Great Tit, Blue Tit, Wren, Mistle Thrush, Song Thrush, Blackbird, Redstart, Robin, Blackcap, Garden Warbler, Whitethroat, Willow Warbler, Chiffchaff, Spotted Flycatcher, Hedge Sparrow, Starling, Greenfinch, Goldfinch, Linnet, Chaffinch, Yellowhammer, Reed Bunting, House Sparrow, Tree Sparrow.

STOCKSMOOR COMMON

Kestrel, Lapwing, Lesser Black-backed Gull, Wood Pigeon, Swift, Skylark, Swallow, Rook, Great Tit, Blue Tit, Wren, Blackbird, Grasshopper Warbler, Whitethroat, Hedge Sparrow, Tree Pipit, Starling, Linnet, Redpoll, Chaffinch, Reed Bunting, Yellowhammer.

Entomology (J. H. Flint): The day was ideal for entomologists and in Bretton Park there were plenty of insects although most of these were the common species of woodland and grassland. The bugs (Hemiptera) to be expected on oak, lime, alder and so on were duly taken. Butterflies were scarce but five species were noted. Several Chimney-sweeper moths (*Odezia atrata* L.) flew out of a small area of long meadow grass but the most noticeable species were the 'longhorn micro-moths' *Adela degeerella* L. which were plentiful on the margins of the woodland. Hoverflies were active and the quantity of *Xylota sylvarum* L. was a feature of the riverside woodland. *Merodon equestris* F., *Volucella pellucens* L. and other large species were seen but the only noteworthy fly was a *Xylota nemorum* F. taken by Mr. Crossley.

Sawflies were scarce and most of those taken remain to be identified later but three rather local species were *Tenthredopsis litterata* Geoff., *Tenthredo scrophulariae* L. and *T. colon* Klug. Solitary bees also were scarce but there were a few wasps, the small black species of *Crossocerus* moving very rapidly in the hot sunshine. Wasps taken were *Passaleucus monilicornis* Dahl. (new to V.C. 63), *Crossocerus confusus* Schulz (the first Yorkshire record), *C. dimidiatus* F., *C. elongatulus* Lind., *C. varius* Lep., *Pemphredon lugubris* Lat. and *Argogorytes mystaceus* L. The beetles consisted similarly of common species and included the soldier beetles *Cantharis fulvicollis* F. and *Malthinus flaveolus* Pk., the striking black and yellow longhorn *Strangalia maculata* Poda and *Antherophagus nigricornis* F. The curious slug-like larvae of *Cionus scrophulariae* L. were devouring the leaves of the figwort (*Scrophularia nodosa*).

The upper lake, the only one visited, was unproductive except at the marshy top end where the water-beetles were collected by Jeremy Flint. Even here the number of species was not large and included some larvae of *Dytiscus* and adults of *Agabus bipustulatus* L., *A. sturmi* Gyll., *Ilybius fuliginosus* F., *I. ater* Deg., *I. obscurus* Marsh. and *I. subaeneus* Er., this being the fourth Yorkshire station for the last named and it was plentiful here. The reed-beetle *Donacia simplex* F. was common on the *Sparganium*. No larger dragonflies were seen but there were plenty of the smaller damselflies at this spot, *Ischnura elegans* Lind., *Coenagrion puella* L. and *Pyrrosoma nymphula* Sulz.

During the afternoon two of the entomologists visited Stocksmoor but this was very unproductive, the only insects worth noting being the fly *Volucella bombylans* L. and the Forester moth (*Procris statice* L.).

Vascular Plants: The party was favoured with ideal weather conditions and although the small group of botanists present only investigated a small area of the park this covered various types of habitat, including grassland, woodland, waterside and some cultivated land. One of the features of the park was the amount of regeneration taking place in the wooded areas of both native and introduced species of trees. Especially conspicuous were thickets of Hornbeam saplings of various ages, mature trees of the species being laden with fruit. Of the many fine planted trees the Tulip tree (*Liriodendron*) bearing a magnificent crop of flowers was perhaps the most conspicuous.

A hundred and forty-four species were recorded, almost all of which were plants of wide distribution. The following species may be mentioned:

Ranunculus sceleratus (Celery leaved Crowfoot), *Rorippa islandica* (Marsh Yellow Cress), *Hypericum perforatum* (St. John's Wort), *H. tetrapterum* (Square-stalked St. John's Wort), *Spergularia rubra* (Sand Spurrey), *Potentilla anglica* (Tormantil), *Epilobium roseum* (Pale Willowherb), *Myriophyllum* sp. (Water Milfoil) (seen out in lake but out of reach), *Callitriche intermedia* (Water Starwort), *Polygonum amphibium* (Amphibious Bistort), *Scrophularia aquatica* (Water Figwort), *Scutellaria galericulata* (Skullcap), *Succisa pratensis* (Devils Bit Scabious), *Senecio erucifolius* (Hoary Ragwort), *Petasites hybridus* (Butterbur), *Potamogeton crispus* (Curled Pondweed), *Juncus inflexus* (Hard Rush), *Lemna trisulca* (Ivy Duckweed), *Carex nigra* (Common Sedge), *C. hirta* (Hairy Sedge), *C. echinata* (Star Sedge), *C. remota* (Remote Sedge), *Bromus ramosus* (Hairy Brome), *Trisetum flavescens* (Yellow Oat), *Milium effusum* (Wood Millet).

Leaving Bretton Park in the afternoon, the party then proceeded to Stockmoor, where a fairly extensive survey was undertaken. Forty-four species not recorded at Bretton were added to the list.

The Common provided habitats for plants of Birchwood, grassland of a rather dry type, and wetter areas. The latter situations supported quite large populations of the hybrid Woundwort (*Stachys* $\times$ *ambigua*) as well as an abundance of *S. palustris* and a smaller quantity of *S. sylvatica*, the parents. The various colonies of the hybrid varied considerably in breadth of leaf, length of petiole and colour of flowers.

An interesting find was a number of plants of *Veronica scutellata* (Marsh Speedwell) in a wet area but *Gnaphalium sylvaticum* (Wood Cudweed), known to be present there was not seen on this occasion.

Other species seen included the following: *Equisetum palustre* (Marsh Horsetail), *Ranunculus flammula* (Lesser Spearwort), *Viola palustris* (Marsh Violet), *Lychnis flos-cuculi* (Ragged Robin), *Stellaria alsine* (Bog Stitchwort), *Impatiens parviflora* (Small Balsam), *Lotus uliginosus* (Greater Birdsfoot Trefoil), *Malus sylvestris* (Crab Apple), *Epilobium hirsutum* (Great Hairy Willowherb), *Hydrocotyle vulgaris* (Marsh Pennywort), *Galium palustre* (Marsh Bedstraw), *Gnaphalium uliginosum* (Marsh Cudweed), *Dactylorchis fuchsii* (Common Spotted Orchis), *Sieglingia decumbens* (Heath Grass).

The botanists left both places with the feeling that further search would produce other species and particularly the lakes at Bretton Park.

POCKLINGTON CANAL V.C. 61 — 20th July

The weather for this meeting was wet until lunchtime, but improved in the afternoon. The Divisional Secretary had arranged visits to a number of sites along the canal banks, which gave us some idea of the wide and interesting variety of its flora and fauna.

Thirty-seven members attended the meeting, representing seventeen Societies. Mr. R. F. Dickens took the Chair at the meeting for reports after tea. A vote of thanks to the landowners who had given us permission to visit their parts of the canal banks and to Mr. E. Chicken the Divisional Secretary who had made all the arrangements, was expressed by Mrs. K. G. Payne.

Ornithology (R. F. Dickens): General weather conditions probably resulted in a lower bird total than might otherwise have been listed but, on the other hand, possibly more species were in song in the damp, still conditions. The total number of species reported during the day was 49, of which 15 were in song.

The most notable records were of a female Shoveler at Canal Head, about thirty Mallard in eclipse below the lock between Eastfield House Farm and Toft Houses. A good colony of Reed Warblers was in the same area, Kestrels had young in the nest near Westfield Farm, Melbourne, and a family of recently fledged Kestrels were near Thornton, less than two miles to the east. Here five birds could be seen in the air

together. A Short-eared Owl was quartering the ings beyond the beck north from Westfield Farm.

With the improvement in weather conditions later in the morning, a movement of Lapwings became evident. Flocks of four, twenty-seven, twenty-two, and one hundred and thirty flew W.N.W. within about half-an-hour near Westfield Farm and other flocks were seen in other areas. The final observation was a Swallow's nest, reported from the ladies toilet at the Barmby New Inn.

A full list of species, with S to indicate those in song, follows: Mallard, Shoveler, Kestrel, C. Partridge, Pheasant, Moorhen, Coot, Lapwing, Snipe, Black-headed and Common Gulls, Herring Gull, Wood Pigeon (S), Stock Dove, Turtle Dove, Short-eared Owl, Swift, Skylark (S), Swallow, House Martin, Yellow Wagtail, Pied Wagtail, Wren (S), Dunnock (S), Sedge Warbler (S), Reed Warbler (S), Garden Warbler (S), Whitethroat (S), Willow Warbler, Spotted Flycatcher, Robin, Blackbird (S), Song Thrush (S), Mistle Thrush, Marsh Tit, Blue Tit, Great Tit, Yellowhammer (S), Reed Bunting (S), Chaffinch, Greenfinch (S), Goldfinch (S), Linnet (S), Redpoll, House Sparrow, Tree Sparrow, Starling, Rook and Carrion Crow.

Entomology (K. G. Payne): Conditions for collecting insects were very far from good. Rain up till lunchtime left the vegetation very wet and glimpses of the sun in the afternoon were inadequate to get many insects flying. The Entomological Section was represented by Mr. R. Crossley, whose notes appear below, and by the writer. Mr. Crossley took one very interesting insect — by far the best of the day. Though detrimental in every other way, the wet conditions did serve to provide a very convincing demonstration of the virtues of a nylon chiffon sweeping net, as used by Mr. Crossley.

The ings, by the canal at Westfield Farm, Melbourne, gave the impression that they may be a rich locality for insects, even though mainly only very common species were taken by the writer. The abundance of the Nitidulid beetle *Kateretes bipustulatus* (Payk) was striking. Hundreds were taken in sweeping a twenty square yard area and many from the canal-side ditches in the water net. These ditches must carry a fairly heavy population of water beetles as very brief application of the water net under rather difficult conditions produced perhaps 50 individuals of the following nine species: *Agabus bipustulatus* (L.), *Ilybius obscurus* Marsh., *I. fuliginosus* Fabr., *Hyphydrus ovatus* L., *Deronectes assimilis* Payk., *Hydroporus planus* Fabr., *Haliphys ruficollis* Deg., *Hydrobius fuscipes* L., *Helophorus aquaticus* L.

Other insects taken on the ings included the Ortalidid fly *Melieria crassipennis* (Fabr.) which was in greater numbers than I have seen it before. The few beetles taken were: *Cantharis fulvicollis* Fabr., *Coccidula rufa* (Hbst.), *Phaedon cochleariae* (Fabr.), *Gastroidea viridula* de G., *Hydrothassa marginella* (L.), *Phyllobius pomaceus* Gyll. The only patch of *Epilobium hirsutum* L. examined yielded the plant bug *Dicyphus epilobii* Reuter.

Mr. Baldwin of Westfield Farm told us that clegs are a great nuisance during farming operations on the ings. On the lane from Eastfield House to the canal near Bielby, Ringlet butterflies were flying quite plentifully. Beating *Artemesia vulgaris* L. here yielded the Trypetid fly *Paroxyna parvula* (Loew. H.). The canal side at the lock by the above lane yielded: *Dromius linearis* Ol., *Agriotes pallidulus* (Ill.), *Malthodes marginatus* (Latr.), *Apion carduorum* Kirby., *Ceuthorrhynchus litura* (Fabr.), *Calocoris norvegicus* (Gmel.) (common everywhere), *Notostira elongata* (Geoff.). The two weevils were beaten from *Cirsium arvense* (L.) Scop.

Joyce Payne mentions the following Lepidoptera as being seen during the afternoon, in addition to the Ringlet, mentioned above: Red Admiral, Small Tortoiseshell, Meadow Brown, Green-veined White, Garden Tiger by canal at Westfield Farm, Drinker Barmby New Inn, Shaded Broad-bar — several seen on ings and in the above-mentioned lane. Several Mirids taken during the afternoon await identification.

Mr. Crossley's notes follow.

(R. Crossley): The ditches adjacent to the canal near Westfield Farm contained numerous corixid nymphs and also a nymph of a *Notonecta* species. Two adult lesser water boatmen were taken and these proved to be *Hesperocorixa sahlbergi* (Fieber) and *Sigara dorsalis* (Leach), both of which are common species. A fine water scorpion, *Nepa cinerea* L. was also seen.

The stretch of marsh vegetation dominated by grasses along the north side of the canal proved quite profitable in spite of the very poor collecting conditions. Here the fly with the banded wings, *Melieria crassipennis* was very common and three species of

Sciomyzidae were taken. These latter are predominantly marsh flies which in the larval stage parasitise or prey upon molluscs in a variety of ways. The species taken were *Knutsonia albiseta* Scop., *Pherbina coryleti* Scop., and *Tetanocera arrogans* Mg., the last being a local species and new to V.C. 61. A single specimen of the bee-like hover-fly *Volucella bombylans* L. was taken, this particular one being the 'red tailed' form known as *var. bombylans*.

The common soldier beetle *Rhagonycha fulva* Scop. was present on umbels and a single specimen of the rather local leaf beetle *Gastrophysa viridula* De Geer was taken. Numbers of the small but attractive beetle *Kateretes bipustulatus* Pk. were also present.

The true bugs (Hemiptera-Heteroptera) were represented by several common grassland species and the small black and green bug *Cyrtorhinus caricis* (Fall.) was especially numerous on the rushes.

Without doubt, however, the best capture of the day was a single male specimen of *Capsus wagneri* Remane. This bug was first recognized in Britain in 1954 when a single specimen was taken at Wicken Fen, Cambridgeshire. Subsequently it was recorded from Askham Bog and these have remained the only two published British localities for this fenland species. The discovery of *C. wagneri* in this new locality is therefore of more than local interest and it is intended to publish a fuller note on this occurrence at a future date.

My thanks are due to Mr. P. Skidmore for identifying the flies and to Mr. J. H. Flint for identifying the beetles and confirming my determination of *Capsus wagneri*.

Vascular Plants (E. Crackles): Various stretches of the Pocklington Canal were examined during the day. Species noted along a stretch of some hundred yards at the Canal Head included: *Plantago media* (Hoary Plantain) and *Galium verum* (Lady's Bedstraw). Large beds of *Carex acutiformis* were noted and other species seen in quantity were: *Epilobium hirsutum* (Great Hairy Willow-herb) and *Glyceria maxima*. *Lycopus europaeus* (Gipsywort) and *Phyllitis scolopendrium* (Hart's-tongue Fern) were noted on the lock walls, whilst *Erysimum cheiranthoides* (Treacle Mustard) was also found in this area.

The party proceeded to Westfield Farm. In the canal here *Lemna gibba* completely covered the water as far as the eye could see in both directions. *Ceratophyllum demersum* (Horn-wort), *Elodea canadensis* (Canadian Pondweed) and *Potamogeton crispus* (Curled Pondweed) were also present, and *Alisma plantago-aquatica* (Water-Plantain) occurred in a nearby drain. Fine specimens of *Galeopsis speciosa* (Large-flowered Hemp-nettle) attracted attention, whilst *G. tetrahit* (Common Hemp-nettle) and *G. bifida* both occurred nearby. A water meadow and marshy areas in this locality proved to be of outstanding interest. Beds of *Carex acuta* occurred in the water meadow, with *C. disticha* also frequent whilst other species noted included: *Myosoton aquaticum* (Water Chickweed), *Stellaria palustris* (Marsh Stitchwort), *Oenanthe fistulosa* (Water Dropwort), *Polygonum amphibium* (Amphibious Bistort), *Lysimachia nummularia* (Creeping Jenny), *Mentha aquatica* (Water Mint), *Senecio aquaticus* (Marsh Ragwort), *Juncus acutiflorus*, *Eleocharis palustris*, *Carex nigra* and *C. vesicaria* (Bladder Sedge). In an area inundated for an appreciable period each year, *Carex vesicaria* and *C. acuta* were remarkably abundant. Additional species present here were: *Thalictrum flavum* (Meadow Rue), *Filipendula ulmaria* (Meadow-sweet), *Lythrum salicaria* (Purple Loosestrife), *Hydrocotyle vulgaris* (Pennywort), *Lysimachia vulgaris* (Yellow Loosestrife), *Menyanthes trifoliata* (Bogbean), *Stachys palustris* (Marsh Woundwort), *Eupatorium cannabinum* (Hemp Agrimony), *Iris pseudacorus* (Iris) and *Sparganium erectum* (Bur-reed).

Apera spica-venti (Silky Bent Grass), locally frequent in parts of Lower Derwent-land was reported from the vicinity of Walbut Lock and from Bielby. *Baldellia ranunculoides* (Lesser Water-Plantain) and *Triglochin palustris* (Marsh Arrow-grass) were reported from the vicinity of the lock. *Nuphar lutea* (Yellow Water-lily), *Rorippa sylvestris* (Creeping Yellow-cress) and *Arctium lappa* (Great Burdock), were noted near Hagg Bridge.

Some of the party visited the vicinity of Sandhill Lock. *Carduus acanthoides* x *C. nutans*, *Silau silaus* (Pepper Saxifrage) and *Jasione montana* (Sheep's-bit) were recorded here.

Bryophytes (J. Robertson): Mosses occurred in only a few localities in the areas visited. The dry mortared walls of the old lock at Canal Head yielded: *Bryum argenteum*,

Ceratodon purpureus var. *purpureus*, *Grimmia pulvinata*, *Camptothecium sericeum*, *Tortula muralis*, *T. ruralis*, *Hypnum cupressiforme*, and *Funaria hygrometrica*. Nearer the water, *Conocephalum conicum* covered large areas. On earth in nearby fields *Phascum cuspidatum* was common, and there was some *Barbula unguiculata* on the pathway.

In the water meadows near Westfield House grew large amounts of *Acrocladium cuspidatum*, *Drepanocladus aduncus* with some *Brachythecium rutabulum* and *Amblystegium serpens*.

CONCHOLOGY

(A. Norris): Records of Mollusca have been forwarded to me for three of the five Y.N.U. Excursions for 1968.

On the occasion of the Y.N.U. visit to Catterick, Miss F. A. Gunningham of Otley collected four species from the banks of the River Swale at Catterick and nine from the lake at Hornby Castle. Two species, the flat Ram's-Horn *Segmentina complanata* (L.) and the Lake Orb Mussel *Sphaerium lacustre* (Mull.) both taken from the lake at Hornby were new vice-county records for V.C. 65.

Thirty-five species were collected at the Mickley and Grewelthorpe meeting on the 8th of June. The most important record of the day was a small colony of the Plaited Snail *Acanthinula lamellata* (Jeff.) found in a small marsh at the Mickley end of Hackfall Woods (Grid Ref. 44/230766). This is only the third record of this species for Yorkshire in the past 20 years. Most of the other species found came from the old walls in the village of Grewelthorpe.

On the visit to Pocklington canal on the 20th July, 33 species were found, several of interest. The finding of a single living specimen of Lister's river snail *Viviparus contectus* Müller in the ditch at the ings near Melbourne, again confirmed this species as being a resident of East Yorkshire. *V. contectus* was recorded for East Yorkshire over two hundred and fifty years ago by Dr. Martin Lister, who first recorded it from its only known site at Wressle. The last record of a living specimen from Wressle was collected by William Nelson in 1886. Wressle is nine miles south of Melbourne.

The localities are as follows: (1) Banks of the River Swale, Catterick Bridge; (2) Hornby Castle; (3) Grewelthorpe; (4) Pocklington Canal.

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| <i>Viviparus viviparus</i> (L.), 4 | <i>Arianta arbustorum</i> (L.), 1, 4 |
| <i>V. contectus</i> Müller, 4 | <i>Helix hortensis</i> (Müller), 1, 3 |
| <i>Potamopyrgus jenkinsi</i> (Smith), 3 | <i>H. nemoralis</i> L., 2, 4 |
| <i>Bythinia tentaculata</i> (L.), 2, 4 | <i>H. aspersa</i> Müller, 3 |
| <i>B. leachi</i> (Sheppard), 4 | <i>Hygromia striolata</i> (C. Pfeiffer), 1, 3, 4 |
| <i>Carychium minimum</i> Müller, 3 | <i>H. hispida</i> (L.), 3, 4 |
| <i>C. tridentatum</i> (Risso), 3 | <i>Monacha gramulata</i> (Alder), 3 |
| <i>Lymnaea palustris</i> (Müller), 2, 3, 4 | <i>M. cantiana</i> (Montagu), 4 |
| <i>L. stagnalis</i> (L.), 4 | <i>Helicella virgata</i> (da Costa), 4 |
| <i>L. peregra</i> (Müller), 2, 3, 4 | <i>Discus rotundatus</i> (Müller), 3 |
| <i>Planorbarius corneus</i> (L.), 4 | <i>Arion circumscriptus</i> Johnston, 3 |
| <i>Planorbis carinatus</i> Müller, 4 | <i>A. fasciatus</i> (Nilsson), 3 |
| <i>P. planorbis</i> (L.), 4 | <i>A. hortensis</i> Ferrussac, 3 |
| <i>P. vortex</i> (L.), 4 | <i>A. subfuscus</i> (Drap.), 3, 4 |
| <i>P. leucostoma</i> Millet, 4 | <i>A. ater</i> agg., 2, 3, 4 |
| <i>P. albus</i> Müller, 2 | <i>Euconulus fulvus</i> (Müller), 3 |
| <i>P. crista</i> (L.), 3 | <i>Vitrea crystallina</i> (Müller), 3 |
| <i>Segmentina complanata</i> (L.), 2 | <i>V. contracta</i> (Westerlund), 3 |
| <i>Ancylus fluviatilis</i> Müller, 2, 3 | <i>Oxychilus cellarius</i> Müller, 3 |
| <i>Succinea putris</i> (L.), 4 | <i>O. allarius</i> (Miller), 3, 4 |
| <i>S. pfeifferi</i> Rossmässler, 4 | <i>Retinella pura</i> (Alder), 3 |
| <i>Cochlicopa lubrica</i> (Müller), 3 | <i>R. nitidula</i> (Drap.), 3, 4 |
| <i>Columella edentula</i> (Drap.), 3 | <i>Zonitoides nitidus</i> (Müller), 3, 4 |
| <i>Lauria cylindracea</i> (da Costa), 3 | <i>Limax maximus</i> L., 4 |
| <i>Vallonia costata</i> (Müller), 4 | <i>Lehmannia marginatus</i> Müller, 3 |
| <i>Acanthinula lamellata</i> (Jeffreys), 3 | <i>Agreolimax reticulatus</i> Müller, 3, 4 |
| <i>Ena obscura</i> (Müller), 3 | <i>A. laevis</i> (Müller), 3 |
| <i>Clausilia bidentata</i> (Strom.), 3 | <i>Unio pictorum</i> (L.), 4 |

U. tumidus Philipsson, 4
Anodonta cygnaea (L.), 4
A. anatina (L.), 1, 4

Sphaerium corneum (L.), 2, 4
S. lacustre (Müller), 2, 3

Nomenclature is according to the *Census of the Distribution of British Non-Marine Mollusca* (1951).

FIELD NOTES

Little Bunting at New Marske Reservoir — Second County Record

On the afternoon of 11th November, 1967, T. Bradbury and D. Wood found a Little Bunting (*Emberiza pusilla*) in the hedge of the lane leading to New Marske Reservoir. The bird was watched over a period of 45 minutes as it fed on the ground, or perched on the hedge and as it flew. A fully detailed description was taken by the observers and the record has been accepted by the County Recorders from these details.

The call note, a robin-like 'tic', was heard while the bird was perched and in flight, and is a diagnostic confirmation to the plumage details which included the chestnut cheeks, pale fawn upstripe and black moustacial marks. The bird was seen to be noticeably small though no Reed Buntings (*Emberiza schoeniclus*) were about to aid in a direct comparison.

The first Little Bunting recorded in the County was a male caught at Whitby, with mall or sb therids on 6th October, 1913 and identified by W. Eagle-Clarke (*Naturalist*, 1913, p.421).

A. J. WALLIS

Starlings Waterlogged by Heavy Rain

On the morning of 11th July, 1968 at least a hundred Starlings (*Sturnus vulgaris*) were found close to the Hull Corporation Pier, under a few trees used by Starlings as a summer and autumn roost. All were in a very wet and bedraggled condition following heavy overnight rain, some were already dead, others were taken to the local R.S.P.C.A. and after drying out were able to fly off. According to passers by in the vicinity, the birds had attempted to fly from the trees but had immediately dropped to the ground, and in a few cases, had been seen to drop into the Humber. Eight of the dead birds came into my possession, and were sent to Mr. J. R. Mather who classified them as three Juveniles: two first year males; two first year females; and one adult male. The latter had an elongated bill, with a very pronounced downward curve, the length being 44 mm.

BRIAN S. PASHBY

FROGS — INFORMATION REQUIRED

I am continuing a long-term study concerning the Common Frog and wonder whether any of your readers may have information re the following:

1. Are tadpoles still as plentiful in your district as, say, three years ago?
2. Did you see any spawn which failed to hatch?
3. Did any spawn which did hatch produce noticeably fewer tadpoles than one would have expected?
4. Have any tadpoles been seen with a distinct kink at the base of the tail?
5. Have any tadpoles been seen which gyrated during swimming?
6. Records of tadpoles over-wintering as tadpoles

I should be most grateful for any information along these lines; such should include the exact locality and height if known, the approximate date and observer.

ELLEN HAZELWOOD

44 Rigby Lane, Bradshaw, Bolton, Lancs.

BRYOLOGICAL MEETING AT KIRKHAM ABBEY, V.C. 61,

20th APRIL, 1968

F. E. BRANSON

This meeting was a very productive and enjoyable one. It was a fine sunny day, but thanks to previous rains the bryophytes were moist and not in that dried-up state which makes them virtually unidentifiable in the field. This proved to be one of the best meetings we have known in the East Riding. Eight new vice-county records were made and several others would probably have been so if the specimens collected had been more complete.

The party worked the area bordering the river Derwent to the north of Kirkham Abbey, as far as Firby Wood. At first the route traversed open marshy country surrounded by meadowland. A drainage ditch recently cut through this area proved to be rich in mosses. The broad clayey track then followed, ran parallel to and a few yards from the bank of the river on the one side, with the wooded valley side rising fairly steeply and almost immediately on the other. This track, which was locally marshy and bordered intermittently by shallow runnels and patches of marshy ground, together with the lower stretches of rocky slope bearing a mixture of deciduous trees, was intensively worked for bryophytes. Some members of the party proceeded to Firby Wood where the trees are entirely coniferous. Broadly speaking, the valley is Upper Lias (calcareous clay and limestone) with the Dogger (a type of sandstone) forming the terrace above. One suspects that the picture is by no means as simple as this; some of the boulders on the lower slopes are of sandstone. The species of flowering plants and mosses present, however, indicate that calcareous soils prevail and much of the soil must be rich in humus.

The new vice-county records were as follows (with name of the finder). They have all been accepted by the British Bryological Society as records for V.C. 61.

HEPATICAÆ:

Ptilidium pulcherrimum, Kirkham Abbey Wood (M. Dalby)

Plagiochila asplenoides var. *major*, Kirkham Abbey Wood (M. D. and M. R. D. Seaward)

MUSCI:

Fissidens minutulus var. *minutulus*, Kirkham Abbey Wood (F. E. Crackles)

Trichostomum sinuosum, field near Kirkham Abbey (F. E. Branson)

Grimmia trichophylla, wall by Kirkham Abbey (M.D.)

Isopterygium depressum, Kirkham Abbey Wood, several places (F.E.B.)

Plagiothecium denticulatum c.fr., Kirkham Abbey Wood (F.E.B., M.D.)

P. succulentum, Kirkham Abbey Wood (M.D.)

The chief ecological areas investigated were some water-logged areas, the drainage ditch, an area with rushes (*Juncetum*), a calcareous stream running into the river with marshy areas on its banks and also a considerable amount of tufa formation, woodland, and miscellaneous places. I will now take each of these areas in turn and give an account of the species which we found there.

(a) Water-logged areas with fallen tree trunks, etc.

Leptodictyum riparium c.fr., *Leskea polycarpa*, *Dicranoweissia cirrata* (on willow), *Aulacomnium androgynum*.

(b) Drainage ditch:

One of the most conspicuous mosses here was *Physcomitrium pyriforme* with abundant capsules. There were also patches of *Dicranella schreberana*, and I had a nice specimen of *Weissia microstoma* with abundant capsules. Other species:

Polytrichum juniperinum

Funaria hygrometrica c.fr.

P. commune

Philonotis fontana

P. piliferum

Drepanocladus aduncus

Tortula muralis (on stones)

Acrocladium cuspidatum c.fr.

Bryum caespiticium c.fr.

B. pallens

Marchantia polymorpha

B. pseudotriquetrum c.fr.

(c) *Juncetum*:

Acrocladium cuspidatum (in wet pockets), the drier hummocks dominated by *Pohlia nutans*; *Bryum pseudotriquetrum*, *B. caespiticium*, *Funaria hygrometrica*, *Physcomitrium pyriforme*, and *Phascum cuspidatum*.

(d) *Calcareous stream:*

Here, the tufa formation was considerable, supporting a prolific covering of *Cratoneuron commutatum* var. *commutatum*. There were also dense patches of *Mnium seligeri* and *Brachythecium rivulare*. Also *Bryum pseudotriquetrum*, *Mnium undulatum*, *Cratoneuron filicinum*, and the hepatics *Conocephalum conicum*, *Pellia endiviifolia*, *Riccardia sinuata*, and *Cephalozia bicuspidata* (on a fallen branch).

(e) *Woodland:*

By far the greater number of species were found in the steeply rising wood on the side of the valley.

Atrichum undulatum (of 175 perichaetia bearing capsules examined, 17 had two setae and one had three setae; ratio (%) of mono-, di-, and tri-setous perichaetia = 89.7 : 9.7 : 0.6 (cf. Longton, 1962; Seaward, 1964).

Other species: (*Hepaticae*)

Metzgeria furcata

L. cuspidata

Lepidozia reptans

L. heterophylla

Plagiochila asplenoides var. *asplenoides*

Porella platyphylla

Lophocolea bidentata

Musci

Polytrichum juniperinum

Anomodon viticulosus

Fissidens taxifolius

Thuidium tamariscinum

F. bryoides c.fr.

Cratoneuron filicinum

Dicranella heteromalla c.fr.

Campyllum stellatum

Dicranoweissia cirrata

Amblystegium serpens

Encalypta streptocarpa

Isoetium myurum

Barbula recurvirostra c.fr.

I. mysuroides

Grimmia apocarpa c.fr.

Brachythecium rutabulum

Mnium stellare

B. velutinum

M. undulatum

Cirriphyllum piliferum

M. punctatum

C. crassinervium

M. longirostrum

Eurhynchium praelongum

M. hornum

E. striatum

Orthodontium lineare c.fr.

E. swartzii

Aulacomnium androgynum

Plagiothecium sylvaticum c.fr.

Neckera complanata

Ctenidium molluscum

Omalia trichomanoides

(f) *Waste places, arable land, walls, etc., around Kirkham:*

Ceratodon purpureus var. *purpureus*

Funaria hygrometrica

Phascum cuspidatum

Bryum argenteum

Tortula muralis

B. capillare

Barbula fallax

B. rubens

B. unguiculata

B. bicolor

Grimmia pulvinata

Camptothecium sericeum

Rhytidiadelphus squarrosus

I collected a form of *Ceratodon purpureus* var. *purpureus* from a roadside fence, resembling *Barbula lurida* in appearance macroscopically. This resemblance, of course, vanishes when examined microscopically. It is a very common form and occurs abundantly around Birkham Wood, Knaresborough.

Note on the flowering plants (F. E. Crackles):

It was good to have confirmation of two very old records for the Kirkham area. Toothwort (*Lathraea squamaria*) 'in the woods near Kirkham' seems to have been unconfirmed since Teesdale's time, and Moschatel (*Adoxa moschatellina*), seen in two parts of Kirkham Abbey Woods has not been recorded for the East Yorkshire side of the Derwent this century. Two plants of Herb Paris (*Paris quadrifolia*) were also seen and this species had not previously been recorded for Kirkham.

I am grateful to Miss F. E. Crackles for contributing the second paragraph on the conformation of the area visited and the note on the flowering plants, and to Mr. M. R. D. Seaward for sending me some ecological notes. Also to Mr. A. Crundwell, Mrs. J. A. Paton, Mr. E. R. B. Little and Mrs. J. W. Fitzgerald. Nomenclature follows *Census Catalogue of British Mosses* (3rd edition) by E. F. Warburg for the mosses, and *Census Catalogue of British Hepatics* (4th edition) by I. A. Paton for the hepatics.

F. A. LEES' BOTANICAL COLLECTIONS: PART 2

MARK R. D. SEAWARD

This is the second in a series of papers dealing with the herbaria of F. A. Lees (1847-1921). This, like the previous paper (Seaward, 1967), deals solely with his Lincolnshire work; future papers will be devoted to his Yorkshire collections.

The Lees herbarium was purchased by the Bradford Corporation in 1905 and is housed in the Cartwright Hall, Bradford. Unhappily since that date few research workers have utilised this collection. The contents of flowering-plants, ferns, bryophytes and lichens, provide the nucleus and foundation of Yorkshire and Lincolnshire flora studies (see Lees, 1910); several other counties are also represented. There are approximately 25,000 specimens. Lees' library, comprising about 535 books and leaflets, is housed in the Bradford City Library (for comprehensive details see the special catalogue prepared, 1909), and forms a valuable accompaniment to the herbarium.

Through the courtesy of the Director of the Cartwright Hall I have been able to study the Lincolnshire material during the past few months. The bryophyte and lichen packets in question are annotated in Lees' neat handwriting, and although most are fully labelled, the data on many packets are inadequate and only to one briefed with his Lincolnshire activities would the abbreviations and limited locality information become intelligible.

The moss material (together with that housed at the City and County Museum, Lincoln; Seaward, 1967) constitutes a comprehensive reference collection which substantiates the records published in the Lincolnshire *Outline Flora* (Lees, 1892). Only a brief mention was made to the Cartwright Hall collection in my previous paper, and only two species, *Campylium stellatum* and *Eurhynchium striatum*, were cited. The extent of the Lincolnshire material at that time was not fully appreciated, only a minor search having been made on behalf of the author.

The majority of the bryophyte material is correctly determined although the nomenclature is naturally out of line with modern usage. Once again, the search for hepatic and lichen material to substantiate Lees' *Outline Flora* records has met with only limited success.

The nomenclature and reference numbers of the mosses and hepatics in the check-list which follows are those of Warburg (1963) and Paton (1965) respectively; lichen nomenclature follows James (1965). In each instance the locality (all in North Lincolnshire: V.C. 54) and date of collection are indicated. Fruiting material when present is indicated by *c.fr.*; it is particularly interesting to note the sporophyte-producing capacity of many of the mosses, in some instances a rare feature in lowland habitats. In many cases a reference to a published source is given, and the following abbreviations are used in this connection:

<i>B.L.R.C.Rep.</i>	<i>The Botanical Locality Record Club Report.</i>
<i>L.N.U.Trans.</i>	<i>Lincolnshire Naturalists' Union Transactions.</i>
<i>Nat.</i>	<i>The Naturalist.</i>
<i>Out.Fl.</i>	<i>Outline Flora of Lincolnshire.</i>

I should like to express my thanks to Miss M. Hartley for her assistance in the examination of the packets and to Mrs. J. Appleyard, Miss E. M. Lobley, Mrs. J. A. Paton, Mr. R. D. Fitzgerald and Mr. E. C. Wallace, for their determination or confirmation of some of the bryophyte specimens.

SPHAGNA (11 packets)

- 1/1 *Sphagnum palustre* L., Linwood, 1878 and Rasen, 1878.
- 1/3 *S. papillosum* Lindb., Linwood, 1877.
- 1/5 *S. compactum* DC., Linwood, Dec. 1877 and 1878.
- 1/16 *S. cuspidatum* Ehrh., Linwood, 1879.
- 1/18 *S. subsecundum* Nees, var *subsecundum*, Rasen, May 1878; var. *inundatum* (Russ.) C. Jens., Linwood, Nov. 1877; var. *auriculatum* (Schimp.) Lindb., Rasen, May 1878.
- 1/19 *S. fimbriatum* Wils., Linwood, 1878.
- 1/25 *S. capillaceum* (Weiss) Schrank, Linwood, Nov. 1877, *c.fr.*

TRUE MOSSES (90 packets)

- 5/3 *Polytrichum urnigerum* Hedw., Rasen, 1878, *c.fr.*
- 5/6 *P. piliferum* Hedw., Linwood, Jan. 1878, *c.fr.*; Rasen, 1879, *c.fr.*
- 5/7 *P. juniperinum* Hedw., Linwood, 1878, *c.fr.*

- 8/15 *Fissidens taxifolius* Hedw., Rasen, May 1877, *c.fr.*
 8/17 *F. adianthoides* Hedw., Rasen, 1877, *c.fr.*
 29/12 *Dicranum bonjeanii* De Not., Rasen, Oct. 1877 and 1879.
 31/4 *Campylopus fragilis* (Brid.) B., S. & G., Rasen, 1877, *c.fr.*
 31/6 *C. flexuosus* (Hedw.) Brid., Rasen, 1877.
 35/4 *Tortula intermedia* (Brid.) Berk., Claxby, May 1878.
 35/10 *T. subulata* Hedw., Rasen, Dec. 1877, *c.fr.*
 40/5 *Pottia truncata* (Hedw.) Fühnr., Rasen, 1878, *c.fr.*
 41/2 *Phascum cuspidatum* Hedw., Rasen, Apr. 1879.
 44/7 *Barbula fallax* Hedw. (with 22/4 *Dicranella varia* (Hedw.) Schimp.), Rasen, Apr. 1879.
 44/20 *B. recurvirostra* (Hedw.) Dix., Tealby, 1879, *c.fr.*
 55/2 *Grimmia apocarpa* Hedw., Claxby, May 1878, *c.fr.*
 55/20 *G. pulvinata* (Hedw.) Sm., Claxby, 1878, *c.fr.*
 77/19 *Bryum pseudotriquetrum* (Hedw.) Schwaegr., Rasen, 1878 and Apr. 1879, *c.fr.*
 77/37 *B. capillare* Hedw., Claxby, 1878.
 79/9 *Mnium longirostrum* Brid., Rasen, 1878.
 81/1 *Aulacomnium palustre* (Hedw.) Schwaegr., Linwood, 1878 and 1879.
 87/2 *Bartramia pomiformis* Hedw., Rasen, 1878, *c.fr.* and 1879, *c.fr.*
 91/1 *Breutelia chrysocoma* (Hedw.) Lindb., Linwood, 1879 — see: *Nat.*, 1967, 78.
 98/2 *Orthotrichum anomalum* Hedw., Claxby, May 1878, *c.fr.*
 98/5 *O. affine* Brid., Stainton-le-Vale, March 1878; Rasen, 1878, *c.fr.* and 1879, *c.fr.*
 99/3 *Ulota crispa* (Hedw.) Brid., Rasen, Jan. 1878, *c.fr.*; Legsby, Oct. 1879, *c.fr.*
 101/1 *Climacium dendroides* (Hedw.) Web. & Mohr, Rasen, 1878, *c.fr.* and 1879.
 104/1 *Leucodon sciuroides* (Hedw.) Schwaegr., Claxby, Apr. 1878, *c.fr.*
 109/4 *Neckera complanata* (Hedw.) Hüben., Claxby, 1878; Rasen, Apr. 1878.
 110/1 *Omalia trichomanoides* (Hedw.) B., S. & G., Claxby, May 1878, *c.fr.*
 111/1 *Thamnum alopecurum* (Hedw.) B., S. & G., Linwood, May 1877; Wickenby Holt, Nov. 1879, *c.fr.*
 125/1 *Cratoneuron filicinum* (Hedw.) Spruce, Rasen, Apr. 1878.
 126/1 *Campylium stellatum* (Hedw.) J. Lange and C. Jens., Barnetby Junction, Aug. 1878; Fosdyke, near Lincoln, Aug. 1878 — see: *Nat.*, 1967, 78.
 126/3 *C. chrysophyllum* (Brid.) J. Lange, Tealby, 1879.
 127/1 *Leptodictyum riparium* (Hedw.) Warnst., Rasen, Dec. 1877, *c.fr.*
 129/1 *Amblystegium serpens* (Hedw.) B., S. & G., Claxby, 1878, *c.fr.*
 131/1 *Drepanocladus aduncus* (Hedw.) Warnst. (var. *kneiffii*), Rasen, May 1879 — see: *B.L.R.C.Rep.*, 1878, 41; *Nat.*, 1964, 108.
 131/4 *D. fluitans* (Hedw.) Warnst., Barnetby, 1878.
 133/1 *Scorpidium scorpioides* (Hedw.) Limpr., Wrawby Moor, 1877.
 134/6 *Acrocladium cuspidatum* (Hedw.) Lindb., Rasen, May 1877 and Apr. 1879, *c.fr.*
 135/2 *Isoetecium myosuroides* Brid., Stainton-le-Vale, March 1878.
 137/2 *Campiothecium lutescens* (Hedw.) B., S. & G., Claxby, Apr. 1878, *c.fr.*
 138/2 *Brachythecium glareosum* (Spruce) B., S. & G., Rasen, 1878 — see: *B.L.R.C.Rep.*, 1878, 40.
 138/4 *B. salebrosum* (Web. & Mohr) B., S. & G., Rasen, Dec. 1877, *c.fr.* and Nov. 1878, *c.fr.* — see: *B.L.R.C.Rep.*, 1878, 40; *Nat.*, 1967, 79.
 138/5 *B. mildeanum* (Schimp.) Milde, Rasen, 1879, *c.fr.*
 138/6 *B. rutabulum* (Hedw.) B., S. & G., Rasen, Dec. 1877, *c.fr.*
 138/11 *B. velutinum* (Hedw.) B., S. & G., Legsby, 1878, *c.fr.*
 138/12 *B. populeum* (Hedw.) B., S. & G., Claxby, 1878, *c.fr.*
 138/13 *B. plumosum* (Hedw.) B., S. & G., Rasen, 1877, *c.fr.*
 141/1 *Eurhynchium striatum* (Hedw.) Schimp., Rasen, Jan. 1877, *c.fr.*; Legsby (c. 1878) — *E. striatulum* according to *B.L.R.C.Rep.*, 1878, 41; *E. striatum* var. *arcuatum* according to *B.L.R.C.Rep.*, 1879–80, 92 and *Out.Fl.*, 1892, 60; see also: *Nat.*, 1967, 79.
 141/4 *E. praelongum* (Hedw.) Hobk., Legsby, 1878; Rasen, 1878, *c.fr.*

- 141/11 *E. confertum* (Dicks.) Milde, Rasen, 1877, *c.fr.*
 142/4 *Rhynchostegiella tenella* (Dicks.) Limpr., Rasen, 1878, *c.fr.*
 146/1 *Pseudoscleropodium purum* (Hedw.) Fleisch., Rasen, May 1877;
 Osgodby, March 1879, *c.fr.*
 147/1 *Pleurozium schreberi* (Brid.) Mitt., Rasen, 1877, *c.fr.*
 149/4 *Plagiothecium denticulatum* (Hedw.) B., S. & G., Rasen, Dec. 1877, *c.fr.*
 149/12 *P. undulatum* (Hedw.) B., S. & G., Rasen, 1877, *c.fr.*
 154/1 *Hypnum cupressiforme* Hedw., var. *cupressiforme*, Rasen, Dec. 1877,
c.fr. and Linwood, May 1878; var. *resupinatum* (Wils.) Schimp.,
 Rasen, Dec. 1877; Legsby, 1878; Claxby, May 1878; var. *erice-*
torum B., S. & G., Rasen, May 1877.
 156/1 *Ctenidium molluscum* (Hedw.) Mitt., Claxby, Apr. 1878.
 160/2 *Rhytidiadelphus squarrosus* (Hedw.) Warnst., Linwood, 1878, *c.fr.*
 160/3 *R. loreus* (Hedw.) Warnst., Rasen, May 1877, *c.fr.* — see: *B.L.R.C.Rep.*,
 1878, 41.
 161/4 *Hylocomium splendens* (Hedw.) B., S. & G., Rasen, 1878, *c.fr.*
- HEPATICS (6 packets)
 10/8 *Riccia sorocarpa* Bisch. (incorrectly labelled *R. glauca* var. *minor*;
 as *R. glauca* in *Out.Fl.*, 1892, 60), Rasen, Apr. 1879.
 27/1 *Ptilidium ciliare* (L.) Hampe, Linwood, May 1879.
 29/1 *Blepharostoma trichophyllum* (L.) Dum., Linwood, 1879.
 46/8 *Solenostoma crenulatum* (Sm.) Mitt., Linwood, 1879, *c.fr.*
 66/1 *Odontoschisma sphagni* (Dicks.) Dum., Linwood, 1879.
 82/5 *Fruillania dilatata* (L.) Dum., Stainton-le-Vale, March 1878.
- LICHENS (4 packets)
Cetraria islandica (L.) Ach., Firwood on Walesby Road, 1 mile out of Market
 Rasen, 1879 — see: *Nat.*, 1878, 97–102; *Nat.*, 1967, 77.
Gladonia arbuscula (Wallr.) Rabenh. (incorrectly labelled *C. rangiferina* (L.)
 Web. — a species unrecorded from lowland Britain, see: *L.N.U.Trans.*, 16,
 155 (1965)), Linwood Warren, 1877 — see: *Nat.*, 1887, 296.
C. impexa Harm. (incorrectly labelled *C. rangiferina* (L.) Web. — see also previous
 taxon), Linwood Warren, 1878 — cf. *Out.Fl.*, 1892, 60.
C. tenuis (Flörke) Harm. (incorrectly labelled *C. rangiferina* (L.) Web.), Linwood
 Warren, 1878.

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BOOK REVIEWS

Freshwater Fishes of Eastern Canada by W. B. Scott. 2nd edition. Pp. 137
 with 104 black and white photographs and a map. University of Toronto Press.
 London: Oxford University Press. 1967. 21/6.

This paperback covers more than 150 species of fishes and is a model of compact
 publication. Most of the species are illustrated with good quality black and white
 photographs, which are much more useful than inferior colour plates. A surprising
 number of genera and species will be familiar to the British naturalist or angler and thus
 the book will be usable in this country. Apart from scientific and folk names, distin-
 guishing features, size, occurrence, life history and habits are neatly summarised.
 From the humble Sticklebacks, Darters and Minnows to the mighty Muskellunge;
 all are given the same authoritative, concise but very readable treatment. If only
 someone would do the same for the European freshwater fish fauna! T.M.C.

Wild Animals of the British Isles by **Maurice Burton**. Pp. 215 with 32 colour and 54 black and white photographs and numerous line drawings. Frederick Warne and Co. Ltd. 1968. 40/-.

This is the latest volume in Warne's celebrated *Wayside and Woodland* series and is, in many ways, the successor to Edward Step's *Animal Life of the British Isles*. The publishers deserve praise for their fine series of books which have served generations of naturalists and also for having such first rate authors to write for them. This is a very welcome addition to the range.

I like the inclusion of mammals, reptiles and amphibians in the same volume — but regret the author's decision not to include the cetaceans. I go out on my excursions of late with far more chance of seeing a whale than I have of meeting the less common carnivores. However, this is a petty quibble, and this is a very good book.

It is not a field guide, not yet a handbook, but a summary of the present state of our knowledge of the species concerned, up-to-date and readable, but none the less accurate. The increase in studies on the Cinderella groups of vertebrates made this book necessary and it would be a tribute to Dr. Burton if his stimulating work were to need constant revision from now on. The Surrey 'Puma', the Yugoslavian mouse plague of 1967 and a number of topical subjects of this type are covered by this work and, for the first time to my knowledge, the feral cat and dog are treated as full members of the British fauna. The gallery of photographs, apart from a distressingly blue polecat, are a feature of the book — with the largest contribution being made by Jane Burton. If your book shelf still holds a copy of Step's work, now is your chance to bring it up-to-date, and if it does not, here is a book you will enjoy. T.M.C.

Watching Wild Life by **Richard Philps**. Pp. 128 with 100 black and white photographs and 18 text figures. Brockhampton Press. 1968. 21/-.

Dr. Richard Philps, who makes wild life films including some Council for Nature prize-winners, attempts in this book to put over some of the background against which he works. Apart from a few bird portraits taken as stills, the illustrations in the book are enlarged frames from cine sequences. Neither are entirely successful, but the informal sequences of cine shots do at least make one want to see them in full colour and movement.

The background information on fieldcraft, hide work and so on includes some useful hints, but the section on wait-and-see photography has a rather dated feel. My mind went back to the classic articles by Emily Turner in the early issues of *British Birds*.

The main actors in the photographic section are Water Voles and Mink, Foxes, Kingfishers, Honey Bees and Wood Ants. All of them suffer in the translation from cine to still, but even so some of the clipped sequences convey certain behaviour aspects better than a formal still picture. The author points out that animal behaviour was the reason for their inclusion — but then states that this is unashamedly a picture book. In my opinion, it falls heavily between two stools. T.M.C.

Principles of Animal Physiology by **Dennis W. Wood**. Pp. x + 332 with 119 text figures. Edward Arnold Ltd. 1968. 72/-.

This is a very readable text-book which, on the whole, fulfils the claim of its author to serve as an introduction to physiology for students. Although it is a welcome change to see more space and attention devoted to topics which come under the broad heading of neurophysiology (139 pages) some readers may feel that rather more than two fifths of the book devoted to this subject destroys its balance. Certainly such subjects as respiration and metabolism (Ch. 4), excretion (Ch. 5) and temperature relationships (Ch. 8) appear at first sight to have received rather cursory treatment, as they are dealt with in a total of only 40 pages. However, this illusion is dispelled on reading the book. Although some of these other topics are not dealt with in the same depth as neurophysiology they are treated clearly and concisely and provide a sound basis for more detailed reading. The final chapter on homeostasis provides a useful summary to the book. Apart from a few inevitable minor errors the book is well written and attractively published. The figures have been carefully selected and are generally clear and well-annotated. *Principles of Animal Physiology* can certainly be recommended for use by first year undergraduates and will also provide useful additional reading for S-level students. P.J.M.

Animal Societies: from the Bee to the Gorilla by Remy Chauvin, translated by George Ordish. Pp. 285, with 32 plates and 60 text-figures. Gollancz. 1968. 45/-.

This is the English translation of the book originally published in French in 1963. Professor Chauvin, who is Head of the Psycho-physiology and Behavioural Science Department at Strasbourg University, surveys the wide field of social relationships in the animal kingdom by comparing the organisations of the very impressive insect societies of bees, wasps, ants and termites with those of the birds and mammals. Many others have written on this theme already but Professor Chauvin brings to it a lively enquiring mind and a most attractive freshness of approach, and the informal and — on occasion — anecdotal style of writing immediately compels the attention of the general reader and maintains his interest.

The insect societies are the subject of the first half of the book, most detailed attention being given to the honey bee with a shorter chapter on the ants and only fourteen pages on the wasps and termites. The section on the honey bee is an admirable and up-to-date account of their social activities with a lucid account of the work by von Frisch and others on the language of the bees and on its variation in local races of bee; and this is followed by accounts of many investigations carried out in the Strasbourg laboratory by Chauvin and his co-workers as for instance on the antibiotic substances present in the hive and on problems of cohesion and defence of the colony and these latter aspects are the ones chosen for most detailed treatment in the accounts of the ants and termites.

A chapter on migration, illustrated by locusts and lemmings, is sandwiched somewhat incongruously between the account of the insect societies and the second half of the book which is devoted almost entirely to the vertebrates, largely to the birds and mammals. A chapter on the elements of social life, viz. territory, recognition and social hierarchy, is followed by one on means of communication and separate chapters then deal with the birds, the primates and the other mammals. The unity of treatment and co-ordination of material, achieved so well in the first half of the book, is less evident here and there is some repetition particularly on the subject of social hierarchies. Nevertheless, the author's enthusiasm for his subject makes this section no less fascinating than the first and the book as a whole brings out very clearly the distinctive features of insect, bird and mammalian societies.

The translation into English by George Ordish is excellent. Very few mistakes were noted. The 'sandpipers' referred to on pp. 204 and 207 are clearly ruffs, and the notes on the plates at the end of the book would have been more helpful had the plates been numbered. E.B.

The Pocket Encyclopaedia of Plant Galls in Colour by Arnold Darlington, with illustrations by M. J. D. Hirons. Blandford Press. 25/-.

There will be an especial welcome for this book since nothing comparable is available at present. The works of Connold (1909) and Swanton (1912) have long been out-of-date and out of print and a new introduction to the plant galls has been much needed. This book consists of 80 coloured plates followed by 71 pages of explanatory text, with a brief introduction describing the nature of galls and how to study them. Identification is achieved by comparing specimens with the plates and reference is then made to the brief notes in the text. The illustrations, coloured and black and white are, with a few exceptions, good; the text is concise and to the point.

The selection of galls includes the common ones, the bean galls on the willows, the many different galls on the oak, and also a varied selection of less familiar galls, mite galls on scabious, moth galls on plantain, beetle galls on harebell, fly galls on common reed, fungus galls on poplar and so on. It is, however, an introduction and the necessary condensation may be responsible for some misleading statements. The rose galls caused by *Diplolepis eglanteriae* and *D. nervosus*, for example, are not reliably separable since the gall of *D. nervosus* is not invariably spiked. Benson's studies of the bean gall sawflies of the genus *Pontania* appear to have been neglected since *Pontania viminalis* and *P. pedunculi* are treated here as synonyms while *Salix triandra* is said to be galled by *P. proxima* instead of its specific sawfly *P. triandrae*. But these are minor defects which will become apparent only to the more advanced student who must use the specialised literature. This little book should open up a new field to many naturalists. J.H.F.

Field and Meadow Life by **Leif Lyneborg**, edited for the English edition by Arnold Darlington, colour plates by Henning Anthon. Blandford Press. 21/-.

This little reference book complements previous volumes in the series, and consists of 80 coloured plates containing over 600 figures followed by 75 pages of notes on the species figured. The selection of species is Danish and there is a little overlapping of previous volumes, but once again the bulk of what is included is likely to be seen in our own countryside. There is a very wide range of material, woodlice, millipedes, snails, spiders, etc., but the greater part figures insects and plant galls. It is a very attractive book for the young naturalist.

The figures are very good indeed and only two can be criticised; *Carabus nemoralis* and *C. granulatus* are not recognisable as such. The text, unhappily, is not so free from error. An obvious blunder, which undermines confidence, is the name 'Small Copper, *Lycaena phlaeas*' applied to figures of a continental butterfly which rather resembles our Large Copper, a very different species. The queen bumblebee figured, *Bombus terrestris*, has a white tail as on the continent. Our British bee has a buff tail, hence its name, but this distinction is not mentioned and it is described as the 'Buff-tailed Bumble-bee . . . recognised by its silver-grey abdominal tip'. The notes on distribution are sometimes inaccurate or misleading. The beetle *Carabus granulatus* is not 'very common over the whole country'; *Carabus convexus* is not British as implied here; *Broscus cephalotes* is not 'very common on open, more or less dry and sandy soil' in this country. These are three consecutive notes in the book. Errors of this sort appear to derive from a misreading of the standard works, an example of this probably being the statement that the bug *Dolycoris baccarum* is 'one of our commonest and most widely distributed shieldbugs' (which it is not) which is recognisably taken from Southwood and Leston, *Land and water bugs of the British Isles*, although this is not what those authors wrote. The reviewer is puzzled by the inclusion of the larvæ of the Cinnabar and Goat moths with 'spinning larvæ'; the text does not explain this. Is it an error in translation? There are some spelling mistakes in the scientific names.

Ordinarily a popular little book like this would not warrant so long a notice, but the series of which it forms part is so attractive, is so much what the beginning naturalist needs, that it is regrettable that wrong and misleading statements will lead to undermining of confidence. More care should be taken to ensure accuracy and to distinguish those species which do not occur here from those which do. J.H.F.

The Oxford Book of Insects. Text by **John Burton** with **I. H. H. Yarrow**, **A. A. Allen**, **L. Parmenter** and **I. Lansbury**. Illustrations by **Joyce Bee**, **Derek Whiteley** and **Peter Parks**. Pp. 208 (including 96 colour). Oxford University Press. 50/-.

This follows the usual pattern of the series, colour plates with facing pages of explanatory text on species figured. The selection of species, nearly 800, has been well made and ranges from the obvious butterflies and moths to the undistinguished flies such as the abominable *Hydrotaea* which assembles in clouds around the heads of perspiring walkers in the woods on hot days. The text is concise, relevant and accurate. A distinguished panel of entomologists has given assistance and errors are very few. On plate 27 the numbers 2 and 3, 5 and 6 have been transposed and thus indicate the wrong names for the species depicted and on plate 29 segments 3 and 4 of the antennae have been omitted in figure 5.

But a book of this sort depends for its success largely on the quality of its illustrations and these are not uniformly satisfactory. Throughout the book the colour tones are rather muted and the outlines softened and there is a consequent loss of clarity. The butterflies and moths and their accompanying caterpillars are generally well drawn. The grasshoppers, bees, wasps, ants, beetles and some of the minor orders are shown magnified to a suitable size wherever necessary and these also are well executed although in some the background of leaf or bark obscures the outline of the insect and this is a mistake. In contrast, the small jassid leaf-hoppers and many of the flies are shown life size and are too often quite unrecognisable.

It is a great pity that more care could not have been taken with the illustrations. Surely someone could have told the artist that bumblebees do not have broad bands of green hairs or cuckoo-bees bands of blue-grey hairs, that the violet ground beetle, *Carabus violaceus* does not have a marked green sheen on its back, and so on. There are too many such failures and as a result it is not possible to accord the book the warm welcome that one would wish.

J.H.F.

Biological Principles in Fermentation by J. G. Carr. Pp. 88 with 4 plates and 26 text figures. Heinemann. 18/-.

This book is one of the 'Scholarship Series in Biology' and is designed primarily for readers in the sixth-forms and first-year undergraduates, but it may also be of interest to those concerned with fermentation such as amateur wine-makers.

At first glance the book appears to be good; it has introductory chapters on the relevant biology followed by chapters on the manufacture of fermented liquors. Detailed examination does not confirm the initial impression, particularly with reference to the presentation and content of the general biology section. The introductory chapters describe the yeasts and bacteria associated with fermented beverages; microbial nutrition, composition and synthesis; and metabolic pathways in fermentation with special reference to energy gain. Many facts are presented in rather dull and catalogue form. There are areas of confusion, e.g. p. 13 — 'various hydrolytic enzymes, probably those of the Emden-Meyerhof-Parnas pathway (see Chap 4), and in particular invertase'. The enzymes involved in the pathway are not hydrolytic, and invertase is not usually considered a component of the E.M.P. pathway. Further confusion arises when Chapter 4 is referred to since here it stated more correctly that alcoholic fermentation (and hence the E.M.P. pathway) involves a series of dehydrogenations.

The section on basic biology seems to be divorced from the following chapters concerned with brewing, wine and cider making. The descriptions of these industrial processes and the disorders which occur in fermented liquors are interesting, informative and well illustrated. But the avowed object of the book is — 'to explain fundamental biological principles through their application' — and this it is doubtful if the author has achieved. E.H.

Practical Work in Biology. Edited by G. R. Meyer with N. W. Buckingham, E. D. Clarke and M. I. Shiels. Illustrated by E. R. Sakker. Pp. xiii + 217 with 132 illustrations in the text. Warne. 1968. 12/6.

This is a specially adapted United Kingdom edition of a work first published in Australia in 1966. It is a pupil's guide to practical biology, suitable for 'O' Level candidates. Over 200 problems of very varied character have been posed, some to be solved by first-hand investigation, others by research in the library. Animals chosen for study and dissection include the rat, toad and rabbit, and free use is also made of items available from a butcher, such as hearts, brains and eyes of sheep and cows. There is a useful section on skeletons and movement with references to X-ray photographs and human limb movement. One interesting exercise compares the eye with a camera. Instructions are given for providing a translucent screen at the back of an eye on to which the image of a candle is refracted (*not* reflected as in the text). The exercises on reproduction seem rather impractical. What maternity hospital would welcome a visit from an inquisitive class of schoolchildren? 'It may be possible for you to see a strip film on "Human Reproduction"' (p. 85). Should this read film-strip?

In contrast with the lively animal problems some of the plant exercises seem dull. Is any useful purpose served at this level in enumerating the descriptive botanical terms for leaf shape or of fruits? There is virtually no fieldwork apart from a section on soils.

The text is clear and substantially free from errors. A number of misleading statements were, however, found: 'Seeds of many plants are produced by the union of detached parts from male and female flowers' (page 13). One of the characteristics of the Bryophyta is that they have 'many celled chlorophyll' (page 17). Most of the diagrams are clear and useful, but some, such as Fig. 6 showing muscle and gland from the neck of a rat as seen with a lens are useless.

My impression is that lively pupils will enjoy this book with its numerous invitations to investigation and exploration. Whether teachers will enjoy it is another matter. From their point of view there may be too many injunctions 'Try to get your teacher to . . .' Or perhaps teachers have changed. J.W.

Collect, Print and Paint from Nature by John Hawkinson. Pp. 61 with numerous black and white and full colour brush drawings. Frederick Muller, 1968. 16/-.

A poorly illustrated little book of doubtful educational value. The information and hints contained are common knowledge to any well-trained teacher, both specialist and non-specialist.

Plants, Man and Life by **Edgar Anderson**. Pp. xiv + 251 with 16 illustrations. University of California Press: agents Cambridge University Press. 1968.

Good scientists are not always good writers. Edgar Anderson is both. He does not subscribe to the mistaken belief that the duller the book the more academically respectable it is likely to be. It is a pleasure therefore to welcome a new edition of this excellent book which first appeared fifteen years ago. In it Dr. Anderson writes about cultivated crops, plants and weeds. Their origins and history often require for solution evidence provided by cytologists, geneticists, taxonomists, archaeologists, geographers, ethnographers and historians. The very complexity of the problems they raise therefore has been largely responsible for their long neglect. Dr. Anderson has himself contributed notably to techniques appropriate to the problems concerned and has shed light on many dark places. It is a fascinating if baffling story of the piecing together of scattered and fragmentary evidence, much of it still awaiting the collecting and much of it highly relevant to human affairs. This should be required reading for every degree student in botany though it is so admirably written and non-technical that any intelligent adult with only a marginal interest in botany would enjoy reading it. W.A.S.

The Roe Deer of Cranborne Chase by **Richard Prior**. Pp. 218 with 11 pages of photographs and 42 text figures. Oxford University Press. 1968. 50/-.

The description of this work as an ecological survey is rather misleading — it is much more. It is a very full account of the life of Roe Deer as lived in a part of Dorset. The author, with two deer books to his credit already, has assembled such a volume of information on the Roe of Cranborne Chase that this work must, as the publishers suggest, become a classic. The history of the Roe in the area, study techniques, and all aspects of the seasonal and life history are covered. Important chapters cover census work, population structure, management and culling. The appendix by Dr. A. McDiarmid on parasites and diseases is an extremely valuable feature of the book.

With the present increase of the Roe Deer, especially in Yorkshire and other northern counties, and also with the current high level of interest in deer, both by naturalists and sportsmen, this book is very timely. However, if you have any interest in animal communities of any kind you will gain a great deal from Richard Prior's study. T.M.C.

Be a Nature Detective by **Maxwell Knight**. Pp. 174 with 17 black and white photographs and numerous line illustrations by R. B. Davis. Warne. 1968. 21/-.

The late Maxwell Knight was a great inspirer of natural history interest amongst both young and old. Books, films and broadcasts in which he had a hand, blended science with wonder and authority with speculation, and exercised a far-reaching influence. This book covers a lot of ground and throughout urges the reader towards field studies. Tracks and trails, food remains, homes and resting places of a great variety of animals are covered.

All the time the emphasis is on detection and the techniques and discipline of organised observation are used through the whole work. The final chapter on fables and legends presents a new slant on fact gathering for the young naturalist.

This is a book which can be recommended to all young naturalists and a considerable number of older ones also. T.M.C.

The Adjutant. Vol. 1, No. 1. Published March 1968. 5/-.

The Army Bird-Watching Society was formed in 1961 and has already been publishing quarterly bulletins. Now, under the editorship of Major (Rt'd) C. Worrin, T.D., F.Z.S., M.B.O.U., the first of its annual journals has appeared. Major Worrin is also Secretary/Treasurer of the Society and copies of the journal may be obtained from him c/o Army Apprentices College, Harrogate. The nature of the organisation precludes the possibility of a report based on the customary species list and one is pleased to find instead that the present 22 pages contain short accounts of observations in Oman, Malaysia, Tripolitania, and Guyana. There are notes, too, on the (to British-based ornithologists) more familiar areas of Texel and Falsterbo.

Any ornithologist, whether in the forces or not, who finds himself visiting any of these areas will find the accounts invaluable. Major Worrin is to be congratulated on launching the journal with such a diversity of sources and material.

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The Entomologist's Record

and Journal of Variation

A monthly illustrated magazine, founded by J. W. Tutt in 1890, is devoted mainly to the Lepidoptera of the British Isles. It also deals with other orders of insects especially Coleoptera, Diptera, Hymenoptera, Orthoptera. Its articles include descriptions of new species and varieties, reports on collecting trips, distribution, habits and habitats of insects and of collecting and study techniques suitable for novice and expert. It circulates in 47 countries.

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THE NATURALIST

A Quarterly Journal

of Natural History for the North of England

Edited by

W. A. SLEDGE, Ph.D., B.Sc., The University, Leeds

with the assistance as referees in special departments of

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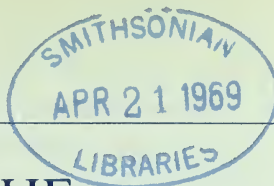
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JANUARY — MARCH 1969



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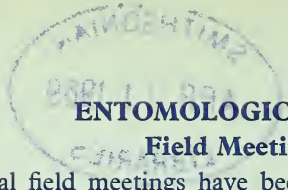
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THE YORKSHIRE NATURALISTS' UNION



ENTOMOLOGICAL SECTION

Field Meetings, 1969

No formal field meetings have been arranged for the coming season; instead it is hoped to organise more excursions than in the past, but at very short notice with particular attention being paid to weather and collecting prospects. Localities to be visited will be decided upon as the season progresses.

Will anyone (entomologist or non-entomologist), who would like to be kept informed please forward a stamped addressed envelope or, preferably a telephone number to: Mr. P. Skidmore, Museum and Art Gallery, Chequers Road, Doncaster.

WANTED

Will anyone not requiring the copy of *Cortinarius* 1, *Myxaciium* and *Phlegmacium* by P. D. Orton, issued separately with *The Naturalist* for July-September 1955, please send to The Editor, *The Naturalist*, The University, Leeds LS2 9JT.

Y.N.U. NEWSLETTER

The Y.N.U. Newsletter, sent to all Full members and Affiliated Societies, is published three times a year: February, May and November. Its aim is to provide a means of intercommunication between all members by giving, for example, reports on Y.N.U. and Society meetings and activities, items of broad Natural History interest, details of all types of surveys and enquiries. All items should be sent to the Newsletter Editor: Mr. H. T. James, 238 Sigston Road, Beverley, Yorks.

FIELD BIOLOGY

The University of London awards a Certificate in Field Biology which is available to all persons interested in the study of living things in their natural habitats. The work involves a directed course of private reading at home, attendance at two Practical Courses each of two weeks held in the Summer of consecutive years, an approved plan of field-work suited to the student's locality to be written up in the form of an essay, and examinations.

The next Practical Course for new students will take place at the Orielson Field Centre, near Pembroke, from 6-20th August 1969. As accommodation is strictly limited early application is advisable.

The regulations and application form may be obtained from the Assistant Director (Room 14), Department of Extra-Mural Studies, University of London, 7 Ridgmount Street, London, W.C.1.

THE NATURALIST

FOR 1969

CETACEANS AT SCARBOROUGH

D. E. WHITTAKER

The local fishermen frequently observe large creatures breaking the surface or leaping from the water, but it is usually impossible to ascribe the sightings to any particular species. The Scarborough fishermen are reliably accurate in their descriptions, and readily distinguish a shark sighting from that of a cetacean; the former are usually termed 'Askers' if they are large and unknown, while the latter are called 'Blow-fish'. A 'large' whale was seen on several consecutive days in early September by several local crews and it became the topic of much conversation at the fish-market, but unfortunately I was unable to obtain any useful information about its exact size or form. In May the *Margaret Jane* trawled up a single vertebra of a large cetacean, but the specimen was thrown overboard some days later. While working the same fishing ground one month later, the same crew found the net to be bulging with a section of a whale's lower jaw. The section, which is broken at both ends, is nine feet long and is evidently part of the skeleton of a whalebone whale. Although somewhat pitted and encrusted, the bone is now at Woodend Museum and it is hoped that eventually other parts of the skeleton will be brought to the surface and that these will enable identification of the corpse possible. Other records are:

PORPOISE (*Phocoena phocoena* (L.))

One mature specimen, of undetermined sex, found stranded on the beach at Gristhorpe Bay, 25th February 1963.

One mature female was found washed ashore near the Spa at Scarborough, 14th January 1966. The head was deeply and cleanly lacerated, perhaps wounds from a ship's screw, but otherwise the condition was excellent. When dissected it was found to contain a well-developed foetus, approximately 13" (330 mm.) long.

One mature specimen, in a very putrid condition, was found washed up among the rocks at Burniston Bay by Mr. C. Ridge in January 1967. It was hidden beneath a pile of rocks by Mr. Ridge and the skeleton was then recovered at a later date and is now at Filey Secondary School in the disarticulated state; the skull is damaged.

One specimen, in a very decomposed state, found among the rocks, 100 yards north of Ravenscar Peak, October 1967.

A single specimen, presumed to be of this species, was seen from the deck of a local keel-boat on 6th June 1968.

A male porpoise calf, 2 ft. 8½ in. long (819 mm.) was found stranded among the rocks at Hayburn Wyke on 20th June 1968. The specimen had been there for several days, as the skin was badly cut and holed and the viscera were teeming with fly larvae. Although it was impossible to examine the stomach contents, it was assumed that the calf had been subsisting on a milk diet, as the teeth had not yet appeared through the gums; the foetal hairs, which in the porpoise usually number two upon each side of the head, had been lost before death. After soaking the specimen in a tub of formalin for two or three days, a fairly acceptable plaster mould was prepared, and a fibre-glass cast of the calf was made. The cast and the disarticulated skeleton are now in my collection.

An immature female was found dead on the long-lines of the Scarborough coble *Who Cares* on 5th December 1968. The specimen, which was 4' 8" long (1449 mm.) and weighed 83 lb., was in excellent condition and had been foul-hooked through one eye; the stomach contained the partially digested remains of seven fish. The local fishermen have recollections of other Porpoises caught on the long-lines in previous years, but are of the opinion that these animals make no attempt to remove the long-line bait, since the majority of specimens found on the lines have invariably been foul-hooked or tangled in the line. As with the above calf, a cast of the specimen has been taken and the skeleton preserved.

A report of a porpoise caught in a salmon-net in Filey Bay was seen in the *Scarborough Evening News* for 4th July. On investigation however, it was found that the unfortunate victim was a tope, one of our smaller sharks.

WHITE-SIDED DOLPHIN (*Lagenorhynchus acutus* (Gray))

On the 23rd September, a party of students found a single female specimen of this species about 500 yards south of Cromer Point, Burniston. It was in such excellent condition that I think it would be safe to assume that it had died within the previous twelve hours. The weight of the dolphin, obtained by weighing large sections of the body during the subsequent skeletonisation process, was 276 lb. The horizontal length, measured accurately by two different methods, was 8 ft. 1 $\frac{3}{8}$ in. (2,480 mm.); the curved length, measured along the mid-dorsal line from the tip of the beak to the notch of the tail flukes, was 8 ft. $\frac{1}{2}$ in. (2,452 mm.). The dorsal surface of the head, the upper lip, beak and the margin of the eye were black, while the lower surface, excluding the grey-brown lower lip, was white. The tongue and palate were also white, but mottled with grey and black. The teeth visible above the gums, numbered 29 on each side of both jaws, the cleaned skull possessing 36 teeth on each side of the upper jaw, while the mandible (broken and chipped slightly at its anterior margin) contained 30 teeth on each side. The back, flippers, dorsal fin, the tail stock and the flukes were also black, and a weak grey stripe ran from the eye to the front angle of the flippers. A yellow-brown stripe ran along the side of the body and tail stock and at its anterior margin it became adjacent to the conspicuous white stripe from which this cetacean derives the common English name. The genital area was black and this so tended to obliterate the positions of the mammary pockets, within which the teats are concealed, that at first glance the specimen was taken to be a male. Colour photographs were taken of the dolphin *in situ* on the beach and it was transferred to the Woodend Museum the next day. A series of detailed measurements was taken, together with plaster moulds of large areas of the body, and these will enable a life-size fibre-glass model of the dolphin to be prepared. An examination of the stomach contents revealed the almost completely digested remains of fish matter, together with pieces of very recently swallowed algal fronds. These pieces, about one to two inches in length, were identified as *Ascophyllum nodosum*, the Egg- or Knotted Wrack. The skeleton, which is in perfect condition, is at present awaiting bleaching and degreasing, but will eventually be mounted with the life-size cast.

All references to the White-sided Dolphin in Yorkshire waters tend to regard the species as an occasional and quite rare visitor. The above specimen is only the fifth to be reported for Yorkshire and a sixth is on record for Skegness. However, around the northern half of the British Isles and North Sea this species is quite abundant, if only during the summer and autumn. It is common in the Arctic Circle, and about the Shetland Isles, Fair Isle, Orkneys and the Scottish coasts. To the west it is regularly seen in the Atlantic off Ireland. In the North Sea it is common off the coasts of Holland and Belgium, and next to the common porpoise is said to be the commonest species in Western Norway. Thus the sighting or stranding of this species in our area cannot be regarded as exceptional; it is probably much more abundant than our records suggest.

Assuming the specimen to have been stranded alive and to have died within very few hours of being found, it is of interest to note that the tide during the previous twelve hours was a high spring-tide, and this presumably accounts for the position of the dolphin high up the beach near the foot of the cliff, where with a 17-ft. high tide, the water would be a foot or more deep. At 5.15 p.m. on 22nd September, the beach would have been flooded to the foot of the cliff, and a cetacean entering the area at this time and becoming confused in the turbid waters of this very rocky area would soon come to grief with the ebbing of the tide, low water being at 11.25 p.m. The carcass would then be carried up the beach by the next high tide (5.20 a.m., 23rd September), and left high and dry on the rocks by 10 a.m. when it was discovered. However, this is mere speculation, but it does illustrate how a healthy cetacean wandering in turbid water and with its echo-location system baffled by a multitude of huge boulders and rocky gulleys, can become stranded with the combination of total darkness and the ebbing of the tide.

Marine Mammals by **Richard J. Harrison** and **Judith King**. Pp. 192 with 12 text figures. Hutchinson University Library, London, 1968. 11/6.

This interesting little book was published in hard covers in 1965 and was reviewed in *The Naturalist*, 1965, p. 98. Now reprinted as a paperback at lower cost it still remains up-to-date and can be warmly recommended to all naturalists. T.K.

E. WILFRED TAYLOR, C.B.E., D.Sc., F.R.S.

At the Annual General Meeting of the Union at Bradford on 7th December 1968, the Executive's recommendation that Dr. E. W. Taylor be elected an Honorary Life Member of the Union was unanimously approved.

Dr. Taylor joined the Union in 1911 and is our oldest member in the sense of continuous membership though certainly not in vitality. He was General Secretary of the Vertebrate Section from 1920-38, President of the Section from 1939-45 and Chairman of the Ornithological Division from 1953-6. For nineteen years he was recorder for birds for the York district and was joint editor with the late Ralph Chislett of the Ornithological records and reports from 1957 to 1959. He was also Chairman of the Mammals, Reptiles, Amphibians and Fishes Committee from 1950-2 and has served continuously as Chairman of the Protection of Birds Act Committee since 1950. In 1955 Dr. Taylor was President of the Union. His Presidential Address which was given at Huddersfield on 3rd December 1955, brought up-to-date the information about Yorkshire mammals which had accrued since the publication in 1881 of Clarke and Roebuck's *Handbook of Yorkshire Vertebrata*.

Immediately after the end of the Second World War Dr. Taylor, together with a small group of naturalists and others concerned for the preservation of the countryside, recognised that the continuous contraction or destruction of areas of natural history interest was likely to be progressively intensified unless active steps were taken in the cause of conservation. Their vision resulted in the formation in 1946 of the Yorkshire Naturalists' Trust and ever since its early years Dr. Taylor has been its Chairman, actively involved in its efforts to secure wide public interest in and support for its work, and in the negotiations for the ever-increasing number of sites of natural history interest which have come under its control. The interests of the Trust and of the Union are closely inter-related and he has always been concerned to strengthen the liaison between the two bodies by all possible means.

In the long history of the Union there have been few who have for so many years given more continuous or more dedicated service to the interests of Yorkshire natural history. Dr. Taylor's election to Honorary Life Membership is an expression of the Union's high personal regard for him, its appreciation of all his past services to the Union and its sincere wish that he will remain active in natural history and conservation work for many years to come.

FIELD NOTES

Oviposition on bramble by the Duke of Burgundy Butterfly

In the vicinity of Kendal, Westmorland, the Duke of Burgundy Butterfly (*Hamearis lucina* (L.)) probably reaches the northern extremity of its range in Britain. Here, on 28th May 1968, I observed a female ovipositing on the leaves of cowslip (*Primula veris* L.), one of its two normal food plants, and also saw a female oviposit on the under surface of a leaf of the bramble (*Rubus fruticosus* agg.). Cowslip and primrose (*Primula vulgaris* Huds.) are the usual food plants of this species, and in none of the several works that I have consulted have I found reference to the use of bramble. The observation therefore seems worth placing on record, not only for its intrinsic interest but because of its possible relevance to speciation phenomena. Only one female was seen to oviposit on bramble, but the number of females in evidence was very few.

Oviposition on bramble, which does not necessarily imply successful feeding by the larvae, may take place elsewhere, and either have gone unrecorded or be unknown to me, but on the other hand it may be related to the fact that this is an isolated and peripheral population. As E. Mayr (*Animal species and evolution* — Harvard Univ. Press, 1963) remarks when discussing the problems of speciation and host change in monophagous species, and which are relevant in the present context, 'the crucial events are apt to take place in peripherally isolated populations and these have not yet been studied adequately in even a single one of the groups of monophagous species'. An animal usually finds ecologically optimal conditions near the centre of its range: in peripheral regions selection pressure is not only more severe but different, and it is here that divergent isolates are most likely to be found.

GEOFFREY FRYER

Great Skua taking Coot at Fairburn Ings Nature Reserve

At 12.45 p.m. on 26th October 1968, there was a sudden outcry among the gulls at Fairburn Ings Nature Reserve. As they flew up in a crowd, a dark bird settled on the water. It had a powerful bill and dark plumage and on flapping its wings revealed the clear white mirrors of the Great Skua or Bonxie. It flew low, ignoring the gulls chasing after it, and pounced on a Coot.

The Bonxie seemed to seize the Coot with its feet at the very beginning of the attack. There was a long and desperate struggle, the skua's strong bill wrestling with the Coot which fought like a tiger. They often struggled so violently that the Bonxie itself was half submerged, saving itself by spreading its wings on the water. Throughout, only the Coot's head and shoulders were visible above the surface. It did not dive so the Bonxie must have been gripping it in its feet. Their bills were often locked together, but at last the Coot went limp. The Bonxie pecked at its head, lifting it and letting it drop as if to make sure that it was dead.

For at least half an hour the Bonxie fed on the floating body of the Coot. Other Coots came near to investigate, but soon retired and the Bonxie had a wide area of empty water round it. The Bonxie, a big brown bird with that handsome skua head, drifted slowly, pecking at the dead Coot. A long line of black feathers floated away on the water.

This incident was also witnessed by Mr. W. Blackburn. Coot is recorded in *The Handbook of British Birds* as prey of the Great Skua, but in view of the latter's rarity inland such episodes as the above can seldom have been reported.

GILLIAN GRANGER

Rare Fungus in Leeds

On the 1st August 1968, while photographing colourful Russulas on sloping woodland in the Farnley district of West Leeds, Mr. J. A. Clayton noticed a group of three fungi of peculiar appearance, their caps being broken up by coarse dark scales, suggesting the surface of a pine-cone or pineapple. The underside of the youngest specimen was completely veiled, but a mature example was seen to bear tubes as in Boleti, instead of the expected gills.

Mr. Clayton learned that the rarity was the Pine-cone Fungus *Strobilomyces floccopus* (Vahl. ex Fr.) and some days later Dr. C. J. La Touche and I were shown the site, where two more were found, both in a withered state. There are very few records of this fungus being found in Yorkshire during the present century. Mr. Raymond Booth the artist, found a single specimen early in September 1966 in a roadside plantation near Thorner a few miles from Leeds, and he made a careful sketch of it.

JOHN ARMITAGE

INSECT IDENTIFICATION SERVICE

The Entomological Survey Committee offers to assist with the identification of insect specimens collected by members of Affiliated Societies undertaking survey work. It is not intended to name a long list of common species, but a report will be made dealing with the more interesting ones. Specimens will not be mounted nor can they be returned unless postage is paid. In the first instance specimens should be sent to Mr. J. H. Flint, 7 Norfolk Mount, Leeds 7, who will distribute them to specialists in the various Orders. Advice on how to pack specimens for posting will be given upon application to any member of the Survey Committee.

RESCUE AND RE-INTRODUCTIONS OF THREATENED INSECT SPECIES

The Entomological Survey Committee considers it desirable that naturalists should report any threat to a species with a view to a rescue being effected. Where there is a question of a rescue and/or re-introduction being undertaken it is hoped that the Secretary of the Survey Committee will be first approached to take such steps as he considers appropriate. The Survey Committee are strongly of the opinion that all such activities should be fully recorded in *The Naturalist*.

ROY CROSSLEY,
Hon. Sec., Entomological Survey Committee

THE YORKSHIRE NATURALISTS' UNION

ONE HUNDRED AND SEVENTH ANNUAL REPORT

The Hundred and Sixth Annual Meeting was held on 2nd December 1967, at Barnsley, by invitation of the Barnsley Naturalist and Scientific Society.

The Presidential Address entitled 'Modern Natural History' was delivered by Professor G. C. Varley, and was subsequently published in *The Naturalist*, 73-7, 1968.

The Presidency for 1969 has been offered to and accepted by Miss C. M. Rob, F.L.S.

The Excursions for 1969 will be to:

V.C. 61	Brandesburton Gravel Pits	7th June
V.C. 62	Lastingham	24th-26th May (Whitsun)
V.C. 63	Upper Derwent Valley	21st June
V.C. 64	Halton Gill	19th July
V.C. 65	Jervaulx Abbey	5th-6th July

The highlight of the past year was undoubtedly the very successful symposium held at York University, and jointly sponsored by the Union and the Trust. The theme was 'The Changing Face of Yorkshire' and the lectures, which were greatly appreciated, gave food for thought to many of those present. The success of this conference was largely due to the work of the Trust's Executive Officer.

The sub-committee dealing with the sites of natural history interest in the West Riding area has been able to supply the County Planning Officer with a list of these sites arranged in order of importance. It should be pointed out, however, that this in no way guarantees their conservation though it will ensure that no destruction of any sites will occur through lack of information about them at the Planning Office.

Three issues of the Newsletter have been distributed during the year but the Editor would appreciate more contributions from members and Affiliated Societies.

The unexpected death of Donald Walker has been a severe loss to the Union. His leadership, as Chairman of the Executive, was greatly appreciated by members of the Executive. Many aspects of the Union's activities were given his support and encouragement.

Membership

At the time of writing the membership of the Union comprises one Honorary Life Member, 12 Life Members, 578 Ordinary Members, 51 Associates and 44 Affiliated Societies.

Deaths

We record with regret the death of the following members: K. C. Crosbie, J. Digby Firth, W. G. Fearnside, H. Heald, H. E. Holmes, R. Tottie and D. F. Walker.

Resignations

T. Anderson, Mrs. W. D. Brooke-Taylor, Miss A. J. Collinge, A. Credland, H. A. Darwood, H. Dickinson, Mrs. W. M. Dobson, Miss R. Dowling, J. Farrand, G. S. Gowing, Miss B. Harthan, C. Jukes, Mrs. M. B. Kirk, P. B. Nicholson, A. F. Owen, J. C. H. Peaker, M. K. Taylor, Miss H. M. Thurston, J. E. White.

New Affiliated Societies

Hornsea Bird Club (Hon. Sec.: A. C. Luckham, 5 Greenacre Park, Hornsea).
Teesmouth Bird Club (Hon. Sec.: Mrs. A. L. Cooper, 85 Junction Road, Norton, Stockton-on-Tees).

Change of Secretary

Harrogate Naturalists' Society (Mrs. D. Haythornthwaite, 'Low Garth', Arkendale, Knaresborough).

Rotherham Naturalists' Society (Mr. G. E. Griffith, 231 East Bawtry Road, Rotherham).

Whitby Naturalists' Society (Mr. H. E. Weston, Manor House, Ugglebarnby, Whitby).

Change of Address

Bennett, G. R., 17 Windermere Close, High Green, Brooke, Norwich, Nor 37W.
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Briggs, J., Frimley House, Deepdale Close, Slackhead, Beetham, nr. Milnthorpe, Westmorland.

Briscoe, T., Apt. 310, 226 Jogues Street, Sudbury, Ontario, Canada.

- Calder, Dr. E. A., Carrs House, New York Lane, Rawdon, nr. Leeds.
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 Darnbrough, G. D., 6 Bridge Paddock, Collingham, Wetherby.
 Elsworth, G. D., 14 Greenbank Avenue, Maghull, Liverpool.
 Fenton, K., 17 Mill Walk, Snuff Mill Lane, Cottingham, E. Yorks.
 Gordon, Dr. G. D., Burnt Yates Bar, Clint, Ripley, Harrogate.
 Graddon, W. D., 3 Blake Avenue, Merrivale, Ross-on-Wye.
 Grainger, Miss J., Greenacres, Huddersfield Road, Meltham, Huddersfield.
 Gunton, T. G., The Lodge, Sandy, Beds.
 Hague, J. B., BFES Spandau School, Wavell Barracks, B.F.P.O. 45.
 Hamilton, J., 7 Windsor View, Shaw Cross, Dewsbury.
 Hardcastle, K., 12 The Bank, Leeming, Oxenhope, Keighley.
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 Penrose, R. J., Natural History Section, Bankfield Museum, Halifax.
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 Winter, P. Q., 1 Cook's Row, West Street, Muston, Filey.
 Wood, Miss F., 11 Sunningdale Mount, Ecclesall, Sheffield 11.
 Wray, Miss M., The Bield, Low Laithe, Summerbridge, Harrogate.

New Members

- Archer, M. E., B.Sc., F.R.E.S., 17 Elmfield Terrace, Monk Stray, York (E).
 Barton, B. J., 58 Manston Avenue, Leeds 15 (O).
 Bowring, W., Pinfold House, Carleton Green, Pontefract (B.Z).
 Colville, Dr. B., 26 North Parade, Leeds 16 (C.Z).
 Cozens, F. H., 57 Greencourt Road, Petts Wood, Orpington, Kent (B.M).
 Dickinson, Dr. C. H., Dept. of Botany, University of Newcastle upon Tyne, Newcastle upon Tyne, NE1 7RU (M).
 Feather, K. P., Lumb Ghyll, Crosshills, nr. Keighley (Z).
 Fleming, J., Farm Cottage, Rockwood, Gargrave Road, Skipton (O.Z).
 Fotherby, D. I., 20 Woodall Avenue, Scarborough (B.Z).
 Ginz, E. D., F.C.A., 30 Hazel Beck, Beckfoot, Bingley.
 Hamilton, J., 159 Smithy Parade, Valley Road, Thornhill, Dewsbury.
 Harrison, Miss Janet E., 1 Weelsby Way, Hessle.
 Harrison, R. F., A.M.A., Director, Museum & Art Gallery Service for Yorkshire & Humberside, Farnley Hall, Leeds 12.
 Hodgson, M. G., 1 Driffild Road, Molescroft, Beverley (O).
 Johnson, Mrs. D., Oakerbank Farm, Skipton Road, Killinghall, nr. Harrogate.
 Knight, J. E., 76 Thames Avenue, Guisborough (O.Z).
 Limbert, G., 57 Queen's Park Drive, Airedale, Castleford (O).
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 Owen, Capt. D. B., 16 Redcliff Drive, North Ferriby (O).

Peel, Miss Enid F., Oakridge, Summerbridge, Harrogate (O).
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 Steven, R. M. (A).
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 Wallis, A. W., 54 Westminster Avenue, Holderness Road, Hull (O).

MAMMALS, REPTILES, AMPHIBIANS AND FISHES

C. SIMMS

This report was compiled in November 1968; the recording year is thus November to October inclusive. Substantial numbers of records have come only from the Scarborough and York observers. Records from relevant papers, e.g. D. Whitaker on Marine Fishes (*Nat.*, 906, p. 78) and from Union field meetings reports (*Nat.*, 907, pp. 119, 123), published during the year under review, will not be repeated here. Relevant publications in press or in preparation include: *Amphibia* — Hazelwood (*Brit. J. Herpet.*), Simms (*Brit. J. Herpet.*). *Cetacea* — Massey (*Nat.*), General (flood effects) — Radley and Simms. Unconfirmed reports will be held over until resolved; increasing numbers of 'escapes' account for some of these.

MAMMALIA

INSECTIVORA: Reports of the Hedgehog and Mole are few, except that C.I.M. continues his road mortality study of the former. The same observer has a long list of Common Shrew records from the Scarborough area and of Pigmy Shrews from Sherburn Ings, Raindale, Ganton, East Ayton and Hutton Buscel, together with Water Shrews from the four places last named and also Wykeham and Scarborough itself. C.A.S. reports Pigmy Shrew 'frequently between May and September' (*in litt.*) at Flaxton, and with further records from Riccall, Sand Hutton and near Northallerton (C.S.) this species is better recorded.

CHIROPTERA: Little attention is given to this group. C.I.M. reports three Pipistrelles in the Scarborough—Scalby area but all other confirmed records to date are of single specimens. These are of Whiskered Bat at Skelton near York (M.J.A.T.), Daubenton's Bat from Camblesforth, Noctule and Barbastelle from York (C.S.). A November 1967 *Plecotus* corpse from Snaith was determined as *auritus* (L.) — the Common Long-eared Bat, by Dr. G. B. Corbet.

CARNIVORA: Inconsistently worked, with one recorder attempting too much ground in a single-species survey. The Fox is abundant in many places, but statements of 'increase' or 'decrease' seem poorly based. Stoats and Weasels are little-recorded but should not be taken for granted. Feral ferrets have been killed at Stamford Bridge, unsuccessfully hunted at Flaxton (December 1967) and killed in York (C.S.) but that other feral mustelid, the American Mink, is clearly breeding in Sutton-on-Forest parish and probably elsewhere (C.S. and Y.G.) and continues to be noted at Silkstone (per T.M.C.). Sight records of mink are to hand from Aldwark, Elvington, Escrick and Myton in the Vale of York, and Scampston and Seamer in the Vale of Pickering (C.S. and Y.G.) whilst C.I.M. reports both Mink and Otter from the Esk near Grosmont. The Otter is not scarce and has bred in at least eight Vale of York stations, as no doubt also elsewhere (C.S.). C.I.M. has a long list of reports of Badger from the Scarborough district, but this species badly needs a V.C. 61 recorder. C.I.M. lists locations of setts in his district which will not be repeated here but should go to the appropriate Mammal Society vice-county recorder.

PINNIPEDIA: There are interesting records of Grey Seals to hand from C.I.M. and C.S. which will be reported on in due course. The Common Seal had been seen in Scarborough harbour on 21st and 24th February (C.I.M.).

UNGULATA: Roe are reported from the Howardian Hills (Y.G.).

LAGOMORPHA: There are, surprisingly, no useful records of these to hand this year.

RODENTIA: The Red Squirrel has been introduced or re-introduced here and there, but there are few records of Red or Grey Squirrels to hand. Clearly there are pockets of Red in several places in the lowlands (some of which, at least, are the result of introduced Continental stock) whilst this species is still to be seen in parts of the Pennines — particularly towards the S.W. and N.W. borders of the county. It is now many years since the Dormouse and Harvest Mouse were reliably recorded from Yorkshire, and there appear to be no records of the Yellownecked Mouse, *Apodemus flavicollis* (Melchior). More attention to the small rodents might turn one or other of these up.

CETACEA: Records here are confined to strandings. A Porpoise is reported from Ravenscar on 22nd October 1967, and another at Hayburn Wyke in June 1968 (C.I.M.). A White-Sided Dolphin in Jackson's Bay, Scarborough, on 23rd September 1968, is the subject of a note to be contributed to *The Naturalist* (C.I.M.). During the third week of August 1968, a Killer Whale (about 21 ft.) seems to have come ashore more than once, and came to rest near Kettleness (C.S.)

REPTILIA

British and/or imported specimens of the following native species have been sold in the county this year: Slow Worm, Common Lizard, Grass Snake. *All* reported occurrences must be very closely scrutinised. *Lacerta* and *Natrix* spp. are often wrongly named by *bona-fide* naturalists. The V.C. 61 Tessellated Snakes have not been found this year, but there are unconfirmed reports of Sand Lizards from a V.C. 62 locality.

SLOW WORM: C.I.M. has well-localised records from Glaisdale and near Scarborough. A chain of new localities across the Vale of York and two new localities near the Notts. border (C.S.) are apparently isolated stations.

COMMON LIZARD: A good season, with a crop of new localities in the Scarborough (C.I.M.) and Cleveland (C.S.) districts.

GRASS SNAKE: No further V.C. 61 stations are reported but there are several 'new' ones near Selby, Thorne and Doncaster and a late Lower Farndale discovery (C.S.). This last confirms a recent but undated report from M.B. T.M.C. describes the Y.N.T. reserve at Denaby Ings as 'a stronghold of the species' (*in litt.*).

VIPER: C.I.M. has records from Scalby, Allerston and Fen Bog. On the levels east of Doncaster it has been encouraging to see the good hold this species has, and how well it is known by some local naturalists.

AMPHIBIA

Only the Scarborough district appears to have been really well worked this year, by C.I.M.

NEWTS: Very few records from outside V.C. 62 indicate abundant scope for local surveys. C.I.M. has records of the Palmate Newt from Langdale End and Raindale; C.S. from Scugdale and Newtondale (where it is abundant at Fen Bog).

TOADS: The Common Toad is reported from much of the Scarborough district (C.I.M.); scanty reports elsewhere. The writer has yet to see a Yorkshire-taken Natterjack Toad and suggests that the old records need close attention.

FROGS: The Scarborough district (C.I.M.) supplied many dated stations for the Common Frog; a very encouraging sign. Attention should be paid to breeding success this coming season; Mrs. Hazelwood would welcome reports.

PISCES

Marine fishes later than those covered by Whitaker (*op. cit.*) will be reported on next year. Most records have been abstracted from the angling press by C.I.M. and very few can be mentioned here.

SALMON: Increased numbers of reports from the Ouse system (including a 32 lb. specimen at Boroughbridge) are not necessarily indicators of less pollution; there have been introductions of this and the following two species.

BROWN TROUT: A good season is reported from most waters.

GRAYLING: Has been taken in the Ouse and can be expected in almost any Vale river.

CONTRIBUTORS

T. M. Clegg, C. I. Massey, C. Sims, C. A. Street and the York Group (Y.G.) — P. Balch, M. Buckler, Miss S. Crompton and M. J. A. Thompson.

ORNITHOLOGY

(M. Densley): Two full Sectional meetings were held during the year, both in conjunction with the Mammals, Reptiles, Amphibians and Fishes Section. These meetings were held in March at York, and at Leeds in October. The meeting at York was a departure from the usual tradition of holding both meetings in Leeds, and the March Sectional meeting next year will be held in Scarborough. The meeting in October will be held as usual in Leeds.

At both these meetings Mr. Wallis outlined events of ornithological interest in the county. Roller, Nutcracker, Red Kite, Red Footed Falcon and Sabine's gulls were notable species mentioned, and Mr. Wallis stated that a good breeding season had taken place, particularly for small birds. He expressed a regret that the County Ornithological report had been further delayed in its appearance, but hoped that the reports for 1965 and 1966 would shortly be available to members.

Mr. Cudworth spoke on Spurn Observatory matters at the October meeting, as Mr. Fenton, the Hon. Secretary, was unable to attend. Mr. Fenton had outlined the spring activities at Spurn at the March meeting. A number of new species for Spurn had occurred, Bee Eater and Nutcracker, and spring and autumn Subalpine Warblers there, were also new for the county. A Spectacled Warbler which appeared shortly after the October meeting was a new bird for Britain. Unsuccessful breeding of Little Terns again occurred, this time due apparently to natural causes. By contrast, a course for ringers at Spurn in September, run by the British Trust for Ornithology, was most successful.

Again an annual report for the Observatory has appeared.

Among numerous activities of the Protection of Birds Act sub-committee was the circulation to schools of protection posters, which has proved most useful in the past. Co-operation was reported between the committee and local representatives of national bodies concerned with protection. The death of Donald Walker has been a grievous blow to the cause of bird protection in the county. A new appeal for funds to assist the functioning of this committee was made by its Secretary, Mr. Wilson, at the October meeting. These should be sent to the treasurer, Mr. Disbrey.

A summary of various aspects of the laws affecting wild birds was prepared by Mr. Wilson, and appeared in *The Naturalist*.

Among the formal and informal meetings of the Reports sub-committee was one between themselves and local representatives of the British Trust for Ornithology concerning the organisation of the Trust's 'Atlas of British Birds' project. The committee also recommended the name of C. Bower of Barnsley as a replacement for J. Cudworth, who had asked to be relieved of his position as Recorder for V.C. 63.

Another sea-bird-watching cruise from Scarborough was ably organised by Mr. Wallis in the early autumn. This was well supported by members, and the weather was most kind.

Members of the Section were represented in both audience and list of speakers at the joint symposium of Y.N.U. and Y.N.T. in mid-September at York. The topic was 'The Changing Face of Yorkshire'.

In conjunction with the Bradford Naturalist's Society, the section arranged in early November a showing of colour films made by the well-known Norfolk naturalist, Mr. R. P. Bagnall-Oakley, who gave a live commentary to his films. We are indebted again to Mrs. Butcher and Mr. Fenton for their efforts to make this event the success that it was. The showing of new R.S.P.B. films in the county during November was again a feature of the autumn and winter agendas of a number of local societies.

It is unfortunate that two consecutive annual Ornithological Section reports should contain resignations on the part of the Sections' Hon. Secretary. However, it is with some regret that I have to resign my position after only one year due to other commitments, and inform all members of the Section that from the end of the year the new Hon. Secretary will be: J. F. Roberts, 14 Lynhurst Grove, Brighouse, Yorkshire. Tel: Brighouse 4068.

CONCHOLOGY

(E. Dearing): There have been four indoor meetings during the year: a lively discussion meeting on 'The Larger British Bivalves' in January was well supported and followed in February by a lecture by Mr. J. F. M. de Bartolome. This was a masterly discourse on the genus *Murella* of which the speaker has a personal knowledge

without parallel. Exhibits of all species mentioned, taken on many excursions to the Western Mediterranean, showed the wide range of form to be found in this single genus. Mrs. N. F. McMillan opened a discussion on 'The Mollusca of Canals' in March; she traced the development of the canal system and gave some details of her recent work in the Lancashire area.

Field meetings have been well attended although one which was to have been a joint arrangement with the Lancashire conchologists in September had to be postponed until next season. Collecting in the River Fosse at York was rather disappointing but a visit to a nearby brick-pond produced an abundance of *Anadonta cygnea* to Mr. A. Norris' newly-designed dredge. The Gateforth and Birkin meeting yielded a good number of species, whilst the October meeting to Tadcaster arranged by Mr. J. Summerton commenced with a visit to the local museum, followed by lunch and an afternoon session collecting in brick-ponds, by kind permission of local landowners.

Mr. J. Armitage spoke on 'Succineas' at the Annual Meeting and showed excellent specimens of many species.

It is with regret that we note the passing of one of our oldest members, Mr. J. Digby Firth, who had been associated with the Section since 1908.

Field Meeting Records: (1) York, 6th April 1968; (2) Birkin near Selby, 4th May 1968; (3) Tadcaster, 5th October 1968.

- | | |
|--|---|
| <i>Viviparus viviparus</i> (L.), 1 | <i>Helix aspersa</i> Müller, 1, 2, 3 |
| <i>V. fasciatus</i> (Müller), 2 | <i>Hygromia striolata</i> (C. Pfeiffer), 3 |
| <i>Valvata cristata</i> Müller, 1, 3 | <i>H. hispida</i> (L.), 1, 2, 3 |
| <i>V. piscinalis</i> (Müller), 2 | <i>Monacha cantiana</i> (Montagu), 1, 2, 3 |
| <i>Potamopyrgus jenkinsi</i> (Smith), 2 | <i>Discus rotundatus</i> (Müller), 1, 2, 3 |
| <i>Bithymia tentaculata</i> (L.), 1, 2 | <i>Arison intermedium</i> Normand, 2, 3 |
| <i>B. leachi</i> (Sheppard), 2 | <i>A. circumscriptus</i> Johnston, 2, 3 |
| <i>Carychium minimum</i> Müller, 2, 3 | <i>A. hortensis</i> Férussac, 1, 3 |
| <i>Lymnaea truncatula</i> (Müller), 2 | <i>A. ater</i> (L.) agg., 2 |
| <i>L. glabra</i> (Müller), 2 | <i>Vitrea crystallina</i> (Müller), 2 |
| <i>L. palustris</i> (Müller), 2 | <i>Oxychilus draparnaldi</i> (Beck), 1 |
| <i>L. stagnalis</i> (L.), 1, 2 | <i>O. cellarius</i> (Müller), 1, 3 |
| <i>L. peregra</i> (Müller), 1, 2 | <i>O. alliarius</i> (Müller), 3 |
| <i>L. auricularia</i> (L.), 1 | <i>O. helveticus</i> (Blum), 3 |
| <i>Physa fontinalis</i> (L.), 1, 2 | <i>Retinella radiatula</i> (Alder), 2, 3 |
| <i>Planorbis barbi</i> (L.), 1, 2 | <i>R. pura</i> (Alder), 3 |
| <i>Planorbis planorbis</i> (L.), 2, 3 | <i>R. nitidula</i> (Drap.), 1, 2, 3 |
| <i>P. vortex</i> (L.), 1, 2 | <i>Zonitoides nitidus</i> (Müller), 1, 2 |
| <i>P. leucostoma</i> Millet, 2 | <i>Vitrina pellucida</i> (Müller), 2, 3 |
| <i>P. albus</i> Müller, 1, 2 | <i>Milax budapestensis</i> (Hazay), 1, 3 |
| <i>P. contortus</i> (L.), 2 | <i>Limax maximus</i> L., 3 |
| <i>Segmentina complanata</i> (L.), 2, 3 | <i>Agriolimax reticulatus</i> (Müller), 1, 2, 3 |
| <i>Acroloxus lacustris</i> (L.), 1, 2 | <i>A. laevis</i> (Müller), 2, 3 |
| <i>Succinea putris</i> (L.), 1, 2 | <i>Anadonta cygnea</i> (L.), 1 |
| <i>S. pfeifferi</i> Rossmässler, 2, 3 | <i>A. anatina</i> (L.), 1, 2 |
| <i>Cochlicopa lubrica</i> (Müller), 2, 3 | <i>Sphaerium corneum</i> (L.), 1, 2, 3 |
| <i>C. lubricella</i> (Stabile), 1, 2 | <i>S. lacustre</i> (Müller), 2, 3 |
| <i>Vallonia pulchella</i> (Müller), 2, 3 | <i>Pisidium casertanum</i> (Poli), 3 |
| <i>V. excentrica</i> Sterki, 2, 3 | <i>P. personatum</i> Malm, 3 |
| <i>Clausilia bidentata</i> (Ström), 2, 3 | <i>P. subtruncatum</i> Malm, 2 |
| <i>Arianta arbustorum</i> (L.), 1 | <i>P. henslowianum</i> (Sheppard), 2 |
| <i>Helix hortensis</i> Müller, 1 | <i>P. nitidum</i> Jenyns, 2 |
| <i>H. nemoralis</i> L., 1, 2, 3 | |

Nomenclature is according to the 1951 Census of the Conchological Society of Great Britain and Ireland. The records are collated by Mr. A. Norris.

ENTOMOLOGY

Coleoptera (E. W. Aubrook): While the number of records in the following list is less than in recent years, some interesting species are included. Master Jeremy D. H. Flint's consistent work with the water net has produced many water-beetles which have confirmed old records and extended the known range of other species in

Yorkshire. Of particular interest is his *Hydroporus longicornis* which has been recorded less than a dozen times in Britain.

It is interesting to note that the weevil *Euophryum confine*, originally described from New Zealand and first recorded in Britain in 1942, has now been found abundantly in the West Riding.

The publication of a note by Mr. A. A. Allen (*Ent. mon. Mag.*, 104, 110-12, 1968) on *Plegaderus vulneratus*, a Histerid beetle new to Britain and recorded from single localities in Surrey, Berkshire and Yorkshire, has now made it possible to publish the Yorkshire records here.

I am indebted to the following for records: Mr. R. Crossley, Mr. J. H. Flint, Mrs. H. E. Flint, Master J. D. H. Flint, Mr. F. Hawkin, Lt.-Col. J. Newman and Mr. P. Skidmore. Of the species listed below, five are additions to the county list (†) and eleven to vice-counties (*).

Carabus nitens L. (62) Danby Moor, 1968; Strensall Common, 1968; J.N.

Lyperosomus angustatus Duft. (63) Haw Park, 7/9/68; J.H.F.

**Synuchus nivalis* Pz. (65) Bellarby, 4/7/64; E.W.A.

**Hydroporus longicornis* Shp. (62) Strensall Common, 16/6/68; J.D.H.F. The second Yorkshire record of this rare and little-known species.

Agabus undulatus Schr. (64) Askham Bog, 29/10/67; J.D.H.F. A small colony in a very restricted length of ditch.

A. affinis Payk. (61) Skipwith Common, 25/5/68; J.D.H.F.

**Dytiscus circumcinctus* Ahr. (62) Strensall, 4/68, a smooth female; J.D.H.F.

Ochthebius minimus F. (64) Queen Mary's Dub, Ripon, 4/9/68; E.W.A.

**Berosus affinis* Brull. (63) Potteric Carr, 26/5/68; J.D.H.F.

**Lithocharis nigriceps* Fr. (61) Pocklington Canal, 15/6/68; E.W.A.

**Quedius fulvicollis* Steph. (64) Breary Marsh, Bramhope, 2/2/64; and Hetchell Wood Reserve, 17/2/68; J.H.F. One previous record.

†*Mycetoporus splendens* Marsh. (64) Whernside, 29/5/66; J.H.F.

**Acritis nigricornis* Hoff. (64) Queen Mary's Dub, Ripon, 4/9/68; E.W.A.

†*Plegaderus vulneratus* Pz. (63) Discovered in great abundance in old workings of *Hylurgops palliatus* beneath the bark of dead *Pinus* at Cantley and Sandall Beat Wood in April 1966; P.S. The Cantley site has since been destroyed due to the extension of the Cantley housing estate, but the insect is still abundant in Sandall Beat on trees in just the right state of decay. This beetle has only just been placed on the British List (Allen, *loc. cit.*) and is only known from Oxshott (Surrey), Silwood Park (Berkshire) and the Yorkshire localities mentioned above.

Carpophilus marginellus Motsch. (63) Greenfield, 1967; L. N. Kidd. Only recorded from Huddersfield.

Cartodera elongata Curt. (63) Thurstonland, in cellar, 10/68; E.W.A.

**Scymnus nigrinus* Kug. (63) Haw Park, 7/9/68; J.H.F.

Harmonia quadripunctata Pont. (63) Haw Park, 7/9/68; J.H.F.

Ochina pinoides Marsh. (64) Healaugh, in old *Hedera* stems, 18/2/68; J.H.F.

**Salpingus castaneus* Pz. (63) Farnley Tyas, 17/7/66; E.W.A.

**Bruchus loti* Pk. (63) Stockmoor Reserve, 9/6/68; E.W.A.

†*Apion minimum* Hbst. (62) Strensall Common, 28/5/66; J.H.F.

**Pentarthrus huttoni* Woll. (63) Ravensknowle, Huddersfield, in old timber in stables, 3/68; E.W.A.

†*Euophryum confine* Broun. (63) Ravensknowle, Huddersfield, with previous species, 3/68; E.W.A.

†*Ceuthorrhynchus marginatus* Payk. (63) Farnley Moor, near Huddersfield, 18/6/60; E.W.A.

Hemiptera (J. H. Flint): There has been more activity in the county than ever before by entomologists working in this Order. Another encouraging feature is that the records come from widely separated areas, although, as usual, vice-county 65 has been completely neglected. Some of the species listed below are quite common ones which have nevertheless not been recorded previously in particular vice-counties but most of the new records are of local or rarely-found species. An example of the latter is the curious *Empicoris vagabundus* which has only been noted five times before in Yorkshire, probably because it is so difficult to see on an old wall or tree trunk where

it hunts for psocids and aphids; it overwinters in old ivy, from which it may not be easily dislodged.

The most notable result of the year's work is the discovery of *Anthocoris limbatus* in Yorkshire and of a new locality for *Capsus wagneri*, both due to Mr. R. Crossley. *A. limbatus* is a fenland bug which previously was unknown north of Cambridgeshire. The existence of a colony on old sallows at Wilthorpe Marsh near Barnsley is most remarkable and can be connected with the occurrence of other fenland insects further down the Dearne Valley. A discovery like this is a salutary reminder of how rewarding search in unpromising-looking surroundings can be. *Capsus wagneri* is another notable fenland insect and its only known British haunts were Askham Bog, where it is plentiful, and Wicken Fen, until Mr. Crossley found a single male in the marshes beside the Pocklington Canal near Melbourne. Perhaps diligent search of other marshy areas on the flat central plain of York will yield further localities.

I am grateful for lists of records, or sometimes specimens, from Mr. D. Barnes, Mr. R. Crossley, Mrs. H. E. Flint, Master Jeremy D. H. Flint and Mr. P. Skidmore.

In the following list two species are additions to the county list and twenty-one are new vice-county records.

HETEROPTERA

- Aradus depressus* (F.) (63) Sandall Beat Wood, 25/5/66 and Denaby Ings, several about mycetozoon on rotten branch of *Salix fragilis*; P.S.
- Zicrona coerulea* (L.) (63) Broadhead Clough, 23/7/67; R.C.
- † *Sehirus bicolor* (L.) (63) Adwick-le-Street, 21/10/68; H. E. Beaumont.
- Myrmus miriformis* (Fall.) (63) Hatfield Lings, 1/7/65; P.S.
- Kleidocerys truncatulus* s. *ericae* (Hor.) (63) Hatfield Lings, on *Calluna*, 1/7/67; P.S. Hatfield Moor, 29/6/68; R.C.
- * *Stygnocoris rusticus* (Fall.) (61) Spurn, 13/8/66; C. Devlin (P.S.).
- Empicoris vagabundus* (L.) (64) Ribston Park, three beaten from old ivy on a tree, 29/9/68; J.H.F.
- E. culiciformis* (Deg.) (64) Chapel Allerton, Leeds, one in a bedroom, 22/11/67; J.D.H.F.
- * *Dolichonabis lineatus* (Dahl.) (63) Thorne Moors, 14/7/63; T. M. Clegg (P.S.). The only other Yorkshire record is from Kilnsea Saltings.
- † *Anthocoris limbatus* (Fieb.) (63) Wilthorpe Marsh, Barnsley, 25 and 28/4/68, 19/5/68, females only; 7/7/68, 6/10/68, both sexes; R.C.
- * *Orius niger* s. *compressicornis* (Sahl.) (62) Strensall, 17/4/68; D. B.
- * *Deraeocoris ruber* (L.) (63) Doncaster, abundantly on nettles, 8/68; P.S. West Melton, 8/68; H. E. Beaumont.
- Lopus decolor* (Fall.) (63) Wilthorpe Marsh, 7/67; Hatfield Moor, 7/67; R.C.
- * *Hoplomachus thunbergi* (Fall.) (62) Ellerburn Bank, Thornton Dale, 14/7/68; H.E.F. This is the most northerly British record; the only previous Yorkshire locality recorded is Ripon.
- * *Tinicephalus hortulanus* (M.-D.) (63) Brockadale, Wentbridge, 28/7/68; R.C. Het-chell Wood and Grass Wood are the only other records.
- Megalocoleus pilosus* (Schrk.) (63) Haw Park, on tansy (*Tanacetum*), 24/7/67; R.C.
- * *Plagiognathus albipennis* (Fall.) (63) Quarmby, Huddersfield, on wormwood (*Artemisia*), 21/9/65; R.C.
- * *P. chrysanthemi* (Wolff) (63) Hatfield Moor, 15/7/67; Wilthorpe Marsh, 8/67; R.C.
- * *Dicyphus globulifer* (Fall.) (63) Bretton Park, 22/5/67; R.C.; Blaxton Common, 11/6/68; P.S.
- Globiceps flavomaculatus* (F.) (63) Thorne, 25/6/67; Hatfield Moor, 29/6/68; R.C.
- * *Orthotyphlus virescens* (D. and S.) (63) Hatfield Moor, 15/7/67; R.C.
- * *Lygocoris lucorum* (M.-D.) (63) Quarmby, Huddersfield, 21/9/65; R.C.
- * *Polymerus nigrilus* (Fall.) (63) Brockadale, on goosegrass (*G. aparine*), 28/7/68; R.C. Potteric Carr, July 1965; P.S.
- Megacoelum infusum* (H.-S.) (63) Haw Park, on oak (*Quercus*), 7/9/68; J.H.F.
- Stenotus binotatus* (F.) (63) Hatfield Moor, 15/7/67; R.C. Sprotborough; P.S.
- * *Capsus wagneri* Rem. (61) Melbourne, marshes by Pocklington Canal, one male, 20/7/68; R.C.
- Megaloceraea recticornis* (Geoff.) (63) Hatfield Moor, 15/7/67; R.C.
- * *Salda muelleri* (Gmel.) (63) Hingliff Hill, Langsett, from *Sphagnum*, altitude c. 1,100 ft., 26/8/68; R.C. This and the following are considered to be rare insects

but appear to be much more widespread on high moors than was believed. They are often very numerous when located.

- S. morio* Zett. (63) Hingliff Hill, with the above. Also Cold Edge, Halifax, on bare peat at altitude c. 1,200 ft., 10/8/68; R.C.
- **Hebrus ruficeps* (Thoms.) (62) Strensall Common, abundant among *Sphagnum* on the edges of a pond, 9/6/68; J.D.H.F.
- Velia caprai* Tam. (64) Blea Moor, above Ribbleshead, one macropter among a colony of apters, 7/6/68; J.H.F.
- Microvelia reticulata* (Burm.) (62) Strensall Common, one macropter among an abundance of apters, 16/6/68; J.D.H.F. (63) Wiltshire, on the canal, 29/10/67; R.C.
- Corixa panzeri* (Fieb.) (61) Pocklington Canal at Melbourne, 15/6/68; J.D.H.F. (64) Askham Richard, 10/3/68; D.B.
- Hesperocorixa castanea* (Thoms.) (62) Strensall Common, abundant, 5/4/68; J.H.F. (*63) Langsett, in a quarry pond, 3/67, 3/68; R.C. (64) Ribbleshead, 7/6/68; J.D.H.F.
- Sigara venusta* (D. and S.) (63) Langsett, quarry pond, 3/67; R.C.
- S. semistriata* (Fieb.) (61) Skipwith Common, 24/3/67; R.C.

HOMOPTERA

- **Spseudotettix subfuscus* (Fall.) (61) Skipwith Common, 4/5/68; J.H.F.
- Eurhadina loewi* (Then) (64) Ribston Park, a female beaten from sycamore (*Acer pseudoplatanus*), 29/9/68; J.H.F.
- **Eupteryx notata* Curt. (63) Sandall Beat, 29/5/68; J.H.F.
- **Delphacinus mesomelas* (Boh.) (62) Strensall Common, 9/6/68; J.H.F. Ellerburn Bank, 14/7/68; H.E.F.
- **Eurysa lineata* (Perr.) (63) Potteric Carr, 24/5/68; P.S.
- **Javesella dubia* (Kirsch.) (63) Denaby Ings, abundantly, 29/5/68; Sandall Beat, 29/5/68; J.H.F.
- Paraliburnia lugubrina* (Boh.) (63) Denaby Ings, abundantly, 29/5/68; J.H.F.
- The only other known Yorkshire locality is Sprotborough Flash and these two are the most northerly known British records.

Hymenoptera (Mrs. H. E. Flint): From observations in my own garden it would appear that the very fine weather in the early part of the season gave the social insects in this group a good start and there have been large numbers of the common *Bombus* and *Vespa* species throughout the summer. This also has been a good year for the collectors in spite of poor weather on the organised excursions of the Section. It is very encouraging to have so many people actively interested in this Order and between us we have produced a number of notable records for the county and vice-counties. The compiling of comprehensive lists for specific sites has resulted in many insects or records being given to me. As usual, much of the material collected during the year still remains to be identified.

I am particularly indebted this year to Mr. P. Skidmore for a long list of records of sawflies and to Mr. A. H. Wright for sawfly larvae taken whilst searching for lepidopterous larvae. I would also like to thank the following people whose initials appear in the lists for their contributions: Messrs. M. T. Brook, R. Crossley, J. H. Flint, R. Harris. Determinations of Aculeata are by Mr. Flint; all others by the collectors except where the initials of the person responsible for determinations are given in brackets.

SYMPHYTA

- **Pamphilus hortorum* (Klug) (63) Sandall Beat, 5/67, 5/68; P.S.
- P. inanis* (Vill.) (64) Hetchell Wood, 4/6/68; H.E.F.
- †*Xyphidria prolongata* (Geoff.) (63) Denaby Ings, dead adults in old willows which contained abundant larval workings, 8/3/66; P.S. (*Entomologist*, 1966: 229).
- Sirex cyaneus* (F.) (63) Wath-on-Deerne, one fem. on new housing estate, 8/68; H. E. Beaumont (P.S.). (64) Barwick-in-Elmet, one fem., 3/9/68; R.H. (H.E.F.).
- **Hartigia linearis* (Schr.) (64) Mackershaw Wood, Ripon, 16/7/67; H.E.F.
- Arge cyanocrocea* (Forst.) (62) Strensall, 9/6/68; J.H.F. (63) Blaxton Common, 29/6/67; P.S.

- **Zaraea fasciata* (L.) (64) Barwick-in-Elmet, 13/6/68; R.H. (H.E.F.). The only previous record of this conspicuous sawfly in Yorkshire is in the Victoria County History (Newmillerdam).
- Cimbex femoratus* (L.) (64) Barwick-in-Elmet, an adult female, 10/8/68; R.H. (H.E.F.).
- **Trichiosoma tibiale* Steph. (63) Horbury, 5/67; M.T.B. (H.E.F.).
- **Selandria sixii* Voll. (61) Banks of Pocklington Canal, Melbourne, 15/6/68; H.E.F.
- Dolerus ferrugatus* Lep. (63) Denaby Ings, 11/5/68; P.S.
- Heterarthrus vagans* (Fall.) (63) Potteric Carr, 30/5/68; C. Devlin (P.S.).
- **Empria baltica* Conde (63) Potteric Carr, 24/5/68; P.S.
- E. tridens* (Kon.) (64) Hetchell Wood, 18/4/61; H.E.F. (J.H.F.).
- †*Ametastegia albipes* (Thoms.) (61) Skipwith Common, 25/5/68; P.S.
- **Allantus togatus* (Pz.) (63) Haw Park, 7/67; J.H.F. The only previous record in Yorkshire is from Everingham.
- **A. rufocinctus* (Retz.) (63) Sandbeck, 9/6/66; P.S. Only previously from Robin Hood's Bay.
- Rhadinoceraea micans* (Klug) (63) Potteric Carr, abundant on *Iris*, 24/5/68; P.S.
- Tenthredopsis excisa* (Thoms.) (62) Strensall Common, commonly, 9/6/68; H.E.F.
- Rhogaster genistae* Benson (63) Blaxton Common, one swept from broom (*Sarothamnus*), 11/6/68; C. Devlin (P.S.).
- Tenthredo colon* Klug (63) Gunthwaite, 3/6/66; P.S.
- T. vespa* Retz. (62) Ellerburn Bank, Thornton Dale, 17/7/68; H.E.F.
- **Pachyprotasis antennata* (Lep.) (63) Thorne Waste, 25/6/67; H.E.F. Only twice before in Yorkshire.
- **Macrophya ribis* (Schr.) (63) Wilthorpe Marsh, Barnsley, 2/7/67; P.S.
- **Hoplocampa pectoralis* (Thoms.) (63) Potteric Carr, 24/5/68; P.S.
- †*Stauronematus compressicornis* (F.) (63) Haw Park, one larva which produced the typical 'palisade' of dried saliva around its feeding area on an aspen leaf, 7/9/68; J.H.F.
- **Nematus hypoxanthus* (Forst.) (63) Denaby Ings, 29/5/68; J.H.F.

ACULEATA

- Myrmosa atra* Pz. (64) Hetchell Wood, 31/8/68; J.H.F.
- **Trypoxylon attenuatum* Smith (63) Wadworth Wood, 22/7/65; P.S.
- **Passaleucus monilicornis* Dahl. (63) Bretton Park, 6/7/68; J.H.F.
- †*Ectemnius cephalotes* (Ol.) (63) Rossington Bridge, 15/7/65; P.S. (64*) Copgrove Park, 14/7/67; P.S.
- ***E. cavifrons* (Thoms.) (63) Old Denaby, ex *Salix alba*, 19/7/65; C. Devlin. Denaby Ings, ex *Salix fragilis*, 6/68; P.S. (64) Barwick-in-Elmet, 21/7/68; R.H.
- E. lapidarius* (Pz.) (64) Deep Gill, Hawnby, 16/6/68; R.C.
- **E. continuus* (F.) (63) Potteric Carr, 12/8/65; P.S.
- **Crossocerus pubescens* (Schuck.) (62) Strensall Common, 9/6/68; J.H.F.
- †*C. confusus* (Schulz.) (63) Bretton Park, 6/7/68; J.H.F.
- **Lindenius albilabris* (F.) (64) Adel Moor, Leeds, 8/9/68; J.H.F.

Diptera (P. Skidmore): It is most gratifying to be able to report an increase in the number of collectors in the field of flies in Yorkshire during the past year. In fact an unprecedented number have shown an interest in this much-neglected Order for, while the writer has had little time for entomological work during the past season, he has received records from Mr. M. T. Brooke, Mr. R. Crossley, Mr. J. H. Flint, Mr. R. Harris, Mr. L. N. Kidd and Dr. S. L. Sutton. Mr. Kidd's work on the Yorkshire Mycetophilidae has greatly boosted this year's report and we are much indebted to him for his work on this little-known, but very large family. He, together with several others, has submitted great numbers of other records which are being transferred straight on to the lists of Yorkshire Diptera. It was felt that since so many records were received only those which were new to the county or a vice-county should be published here.

Most habitat types have been worked during the past season, but as in other groups it is the marsh and fenland habitats which are providing the most interesting discoveries. The Dearne marshes again hit the headlines with the discovery of an insect association at Denaby Ings which is well known in south-eastern England but was

unknown north of Cambridgeshire. This concerns the fly *Macronychia unguans* which develops in the workings of the Sphecid wasp *Ectemnius cavifrons*, itself a fen or marsh-land insect. We await with great interest the discovery of further fine fenland specialities in Yorkshire.

The woodland fauna has not been ignored and two noteworthy additions to the Yorkshire list which belong to the sylvan community are the Asilid *Dioctria linearis* and the Oncodid *Oncodes pallipes*.

A discrepancy has come to light regarding certain species recorded as new in last year's report. *Anthomyza bifasciata* and *Amaurosoma flavipes* were erroneously stated to be new to the county when in fact they were only new to a vice-county (V.C. 63). Both had been taken in V.C. 61 by Mr. K. G. Payne but the records had been omitted from the cards. In the present report 29 species are additions to the county list and 45 are new to a vice-county.

TIPULIDAE

- **Nephrotoma flavipalpis* (Mg.) (63) Greenfield, 17/58, in house; also in 1968; L.N.K.
- **N. flavescens* (L.) (63) Greenfield, 7/49; 7/59; 6/66 and 7/67; L.N.K.
- **N. analis* (Schumm.) (63) Greenfield, in house, 2/6/59; L.N.K.
- **Ormosia hederæ* (Curtis) (63) Greenfield, in house, 12/5/67; L.N.K.

ANISOPODIDAE

- †*Anisopus zetterstedtii* Edwards (63) Potteric Carr, 1♂ 24/5/68; P.S.

MYCETOPHILIDAE

- †*Symmerus annulatus* (Mg.) (64) Bolton Woods, 1♂ 13/6/36; J. Wood (det. L.N.K.).
- **Macrocera stigma* Curtis (63) Keighley, 1♂ 7/7/39; J. Wood (det. L.N.K.); High Moor near Scouthead, 1♂ 14/6/52; L.N.K.
- **M. stigmoides* Edwards (63) Haw Park, 1♂ 7/9/68; L.N.K.
- **Urytalpa ochracea* (Mg.) (63) Greenfield, 1♂ in garden on window, 16/6/67, and on garage window, 15/6/68; L.N.K.
- †*Mycomya duplicata* Edwards (63) Haw Park, 1♂ 7/9/68; L.N.K.
- †*M. fimbriata* (Mg.) (64) Malham Tarn, 1♂ 17/7/55; A. Brindle (det. L.N.K.). This species of course is new to the Malham List.
- †*M. vittiventris* (Zett.) (64) Whitewell, several pairs, 6/7/54; A. Brindle (det. L.N.K.). The only other locality for this striking species appears to be Nethy Bridge (Inverness-shire).
- **Sciophila hirta* Mg. (63) Greenfield, 27/6/61 and 7/8/62; L.N.K.
- **Speolepta leptogaster* (Winnertz) (63) Greenfield; taken indoors on 11/5/58, 17/5/58, 6/5/59 and 18/4/61; L.N.K. (Kidd, 1962, *Entomologist*, p. 120).
- **Boletina griffa* Dziedzicki (63) Haw Park, 2♂ 7/9/68; L.N.K.
- **Leia winthemi* Lehm. (63) Greenfield, 1♂ 21/8/67, indoors on garage window; L.N.K.
- †*Meunieria hirta* (Winnertz) (63) Greenfield, single ♂♂ indoors on windows on 21/6/66 and 31/7/68; L.N.K.
- **Docosia gilvipes* (Walker) (63) Yeoman Hey Plantation, Greenfield, 26/7/61; L.N.K.
- †*Exechia dorsalis* (Steager) (63) Haw Park, 2♂ 7/9/68; L.N.K.
- †*E. separata* Lundbeck (63) Haw Park, 1♂ 7/9/68; L.N.K.
- †*E. nigroscutellata* Landrock (63) Yeoman Hey Plantation, Greenfield, 1♂ 26/8/61; Haw Park, 1♂ 7/9/68; L.N.K.
- **Rhymosia fasciata* (Mg.) (63) Greenfield, several during September and October 1961 and 1962; L.N.K. (62) Robin Hood's Bay, 17/5/60; A. Brindle (det. L.N.K.).
- **Allodia sericoma* (Mg.) (63) Haw Park, 1♂ 7/9/68; L.N.K.
- †*Cordyla fasciata* Mg. (63) Yeoman Hey Plantation, Greenfield, 10/9/60; 26/8/61; Haw Park, 1♂ 7/9/68; L.N.K.
- †*Trichonta terminalis* Walker (63) Greenfield, 2♂ 28–30/5/68, both on garage window; L.N.K.
- **Phronia annulata* Winnertz (63) Greenfield, 1♂ 9/7/67, indoors on garage window; L.N.K.
- **Phronia dubia* Dziedzicki (63) Greenfield, 1♂ 30/5/68, indoors on garage window; L.N.K.

- **Mycetophila lineola* Mg. (63) Holme House Wood, Keighley, 1♂ 25/10/36; J. Wood (det. L.N.K.); Yeoman Hey Plantation, Greenfield, 10/9/60; Haw Park, 2♂ 7/9/68; L.N.K.
- **M. luctuosa* Mg. (63) St. Ives, near Bingley, 1♂ 3/11/45 and Holme House Wood near Keighley, 25/10/34; J. Wood (det. L.N.K.); Yeoman Hey Plantation near Greenfield, 10/9/60; Haw Park, 2♂ 7/9/68; L.N.K.
- †*M. trinotata* Staeger (63) Greenfield, 7/7/62, on window; L.N.K.

STRATIOMYIDAE

- †*Geosargus nitidus* (Mg.) (63) Greenfield, 23/6/59; L.N.K. This agrees with the description in Verrall (*British Flies*, Vol. 5, p. 180), but, as he states, it is a very unsatisfactory species.

ASILIDAE

- †*Dioctria linearis* (F.) (63) Pot Riding Wood near Cadeby, 6/7/68; P.S. This locality has been variously referred to in the Reports in *The Naturalist*, as Cadeby Wood and Sprotborough Wood; the correct name though, according to early editions of the Ordnance Survey Maps, is Pot Riding Wood. The *D. linearis* here recorded was a male but in July 1967 a further specimen was seen in the same locality. This is the northernmost known station in Britain for this species, a denizen of old oak forest areas of south eastern and central parts of England.

ONCODIDAE

- †*Oncodes pallipes* Latr. (62) Ellerburn Bank, Thornton Dale, 14/7/68; Mrs. H. E. Flint (det. J.H.F.).

EMPIDIDAE

- †*Empis (Xanthemiis) concolor* Verrall (63) Pot Riding Wood near Cadeby, 6/7/68, numerous on *Heracleum* flowers; P.S.
- **E. (X.) scutellata* Curtis (63) 1♂ Wilthorpe Marsh near Barnsley, P.S.
- **Rhamphomyia flava* (Fallen) (63) Roche Abbey, 1♂ 15/9/65; P.S.
- **R. anomalipennis* Mg. (63) 1♂1♀ Greenfield, on garage window, 1/6/68; L.N.K. Only one previous record for Yorkshire, from Pateley Bridge (C. A. Cheetham).
- **Leptopeza flavipes* Mg. (63) 1♀ Pot Riding Wood, Cadeby, 19/6/66; P.S.
- **Clinocera fontinalis* (Haliday) (63) Slackcotes, 2/9/65; L.N.K. One old record for county from Worton (J. H. Audcent; *Naturalist*, 1910).

DOLICHOPODIDAE

- **Dolichopus claviger* Stannius (63) 1♂ Hatfield Moors, 11/7/65; T. M. Clegg (det. P.S.); 1♂ Roche Abbey 8/7/65; P.S.
- **Porphyrops crassipes* Mg. (63) 2♂ Denaby Ings, 2/6/68; P.S.; Greenfield, 8/6/68; L.N.K.
- **Syntormon tarsatus* (Fallen) (63) 1♂, several seen, Hingcliff Hill near Langsett, 13/7/68; P.S.
- †*Argyra perplexa* Beck (63) 1♂ Greenfield, on windows indoors, 31/8/68; L.N.K.
- †*Machaerium maritima* Haliday (61) 1♂ Kilnsea Warren, 22/7/65; T. M. Clegg (det. P.S.).
- **Hydrophorus nebulosus* Fallen (63) Upperwood near Greenfield, numerous in *Callunetum*, 9/5/53; P.S.; L.N.K., and 27/8/54; L.N.K.

CLYTHIIDAE

- †*Opetia nigra* Mg. (63) 1♂ Denaby Ings, 11/5/68; P.S.

PIPUNCULIDAE

- **Verrallia setosa* Verr. (63), 1♀ Pot Riding Wood, Cadeby, 3/6/66; P.S.

PHORIDAE

- †*Aneurina thoracica* (Mg.) (63) One in Yeoman Hey Plantation, Greenfield, 10/9/60; L.N.K.

SYRPHIDAE

- **Pyrophaena rosarum* F. (62) 1♂ Deep Gill, Hawnby, 16/6/68; R.C.
 **Melanostoma ambiguum* Fallen (63) Numerous at Wilthorpe Marsh on 28/4 and 5/5/68; R.C.
 †*Syrphus latilunulatus* Collin (64) Barwick-in-Elmet; one taken during 1968 by R. Harris.
 †*Neoscia aenea* Mg. (63) 1♂1♀ Wilthorpe Marsh, 18/5/68; R.C.
 †*Pipiza luteitarsis* Zett. (63) Several at Cantley, 24/5/67; R.C., P.S.; 1♂ Little Smeaton, 30/5/67; P.S.
 **Pipizella virens* F. (63) Sparingly at Blaxton Common on 16/6/68; P.S. Specimens recorded under this name from Allerthorpe and Austwick may really refer to *P. varipes*, the common *Pipizella* in northern England which curiously has not yet been recorded from Yorkshire. According to Coe (*R.E.S. Handbook*, Vol. x, pt. 1, p. 58) *P. virens* is an uncommon species only known south of Norfolk.
 **Chilosia albipila* Mg. (63) Several males at Wilthorpe Marsh near Barnsley 28/4/68; R.C.
 **Eristalis abusivus* Collin (61) 1♂ Spurn, August 1968; J. Cudworth (det. R.C).

CONOPIDAE

- **Conops quadrifasciata* De Geer (64) Barwick-in-Elmet, one taken during 1968; R. Harris.

PSILIDAE

- **Chyliza annulipes* Macq. (63) 1♂ Sandall Beat Wood, Doncaster, 29/5/68; P.S. One previous record for Yorkshire, from Pickering (C. A. Cheetham).
 **Psila nigra* (Fallen) (61) 1♂ taken, many others seen, Skipwith Common, 11/6/68; P.S.

SCIOMYZIDAE

- **Renocera pallida* (Fallen) (61) Several at Skipwith Common, 11/6/68; P.S.
 †*Tetanocera arrogans* Mg. (63) Wilthorpe Marsh, 2/7/67 and Denaby Ings, 26/8/67; P.S. (61*) Pocklington, 20/7/68; R.C. (det. P.S.).
 †*Sepedon spinipes* Scopoli (63) 1♂ Sprotborough Flash, 2/6/68; P.S.

OPOMYZIDAE

- †*Geomyza apicalis* (Mg.) (64) Sparingly on the limestone pavement on north-east slope of Ingleborough in June 1955; P.S. An extremely little-known British species which is readily separated from other members of the genus by the very narrow short wings.

EPHYDRIDAE

- †*Caenia fumosa* Mg. (63) 2 specimens taken, others seen, at Denaby Ings, 26/8/67; P.S.

SPHAEROCERIDAE

- †*Limosina rufilabris* Stenh. (63) 1♂ swept from *Eriophorum* on Hingcliff Hill, near Langsett, 13/7/68; P.S.

DIASTATIDAE

- **Diastata nebulosa* (Fallen) (63) Numerous in *Eriophorum* bog on Hingcliff Hill near Langsett, 13/7/68; P.S.

SCATOPHAGIDAE

- **Cordilura pudica* Mg. (61) Several at Skipwith Common, 4/7/67; P.S.
 **Amaurosoma armillatum* Zett. (61) Numerous at Skipwith Common, 25/5/68; P.S.
 ***Chaetosa punctipes* Mg. (61) Skipwith Common, numerous on 25/5/68; P.S. (63) abundant at Potteric Carr and Blaxton Common on 24/5 and 16/6/68; P.S.

TACHINIDAE

- **Servillia ursina* Mg. (62) Strensall Common, one on 5/4/68; J.H.F.

CALLIPHORIDAE

**Metopia campestris* Fallen (64) One taken at Barwick-in-Elmet during 1968; R. Harris.

†*Macronychia unguans* (Pandelle) (63) 1♀ reared from puparium found in workings of the Sphecid wasp *Ectemnius (Clytochrysus) cavifrons* in an old Crack Willow branch at Denaby Ings on 23/6/68; P.S. According to van Emden (*Roy. Ent. Soc. Handbook*, Vol. x, pt. 4a, p. 107), this fly is only known from Cambridge southwards where it occurs with the species of wasp mentioned.

ANTHOMYIDAE

**Acroptena divisa* (Mg.) (63) Abundant amongst *Carex riparia* on Potteric Carr on 24/5/68; P.S. Only previous Yorkshire record from Bedale (C. A. Cheetham).

Lepidoptera (S. M. Jackson): Considering the mixed weather the past year has been a fairly good one and considerably better than 1967, especially for the butterflies. Among the moths, three species (†) have been added to the county list; quite an achievement! My thanks are again due to the following contributors for their lists of records, from which I have selected the more important: J. Armitage, J. Briggs, W. E. Collinson, J. H. Flint, R. Harris, C. R. Haxby, A. M. R. Heron, E. Richards, C. I. Rutherford, C. C. Smith, Dr. S. L. Sutton, P. G. Tannett, M. Taylor and P. Winter.

RHOPALOCERA

Colias croceus Fourc. (Clouded Yellow) (64) Barwick-in-Elmet, one on 24/7/68; R.H. *Argynnis euphrosyne* L. (Pearl-bordered Fritillary) (62) Newton Dale, 5/68; E.R., P.W. Also at Raindale, in same area, 27/5/68; P.W.

Aglais urticae L. (Small Tortoiseshell) Commoner than usual and continuing until late October in all areas; S.M.J.

Nymphalis io L. (Peacock) In contrast to 1967, 1968 has been an exceptionally good one for this species. Apart from the industrial areas it has been reported commonly by several contributors from most parts of the county and I have never before seen it in such numbers in the Selby district; S.M.J.

Vanessa cardui L. (Painted Lady) A few scattered records only have been received from inland areas but it was reported fairly widely in north-east coastal districts; P.W.

V. atalanta L. (Red Admiral) Though still not an outstanding year for this insect, 1968 has been much better than last year. Like *urticae* it has tended to appear later in the season and very many records have been received from all parts of the county. In gardens in the centre of Leeds it was visiting *Dahlia* flowers commonly up to 12/10.

Melanargia galathea L. (Marbled White) (61) Burdale, several seen just emerging on 21/7/68; S.M.J. A new colony discovered at Warrendale, 7/68; M.T.

Eumenes semele L. (Grayling) (61) Kiplingcotes Quarry, several noted on 10/8/68; S.M.J.

Mamiola tithonus L. (Gatekeeper) (61) Market Weighton, just emerging on dyke sides on 27/7/68 and in numbers there on 10/8/68; S.M.J. (63) Noted again at Thorne, 1/8/68; A.M.R.H.

Aphantopus hyperanthus L. (Ringlet) (61) Exceptionally abundant in the Wolds valleys about Thixendale and Burdale, 21/7/68; also at Market Weighton and Kiplingcotes, 27/7/68; S.M.J.

HETEROCERA

Smerinthus ocellata L. (Eyed Hawk) (64) Scholes near Leeds, two in 6/68; S.L.S. Unlike the Poplar Hawk which is distributed throughout the county, the Eyed Hawk is rarely seen in the industrial south-west but is moderately common further east, particularly in the Plain of York.

Acherontia atropos L. (Death's Head Hawk) (63) One live specimen given to the Doncaster Museum on 30/8/68; it had been found in the town, but the finder's name was not given.

Herse convolvuli L. (Convolvulus Hawk) (63) Two specimens were handed in at the Doncaster Museum and Art Gallery on 15/8 and 25/9/68; the former from Intake, found by Master D. Roberts, the latter from Bessacarr found by Mr.

- Eggison. Both examples were alive and in immaculate condition and one ejected a drop of pupal fluid when handled (P. Skidmore).
- Macroglossum stellatarum* L. (Humming-bird Hawk) (61) Spurn, one on 18/7/68; S.L.S.
- Drymonia ruficornis* Hufn. (Lunar Marbled Brown) (64) Bishop Wood, 24/4/68; C.C.S. Not very common in Yorkshire.
- Pheosia gnoma* F. (Lesser Swallow Prominent) (61) An unusually late occurrence of this fairly common moth was at Barlby on 18/10/68; S.M.J.
- †*Odontotia carmelita* Esp. (Scarce Prominent) (62) Ampleforth, one taken on 5/5/68; S.L.S. This species is not uncommon in the Furness district of North Lancashire and in North Nottinghamshire and although there are many apparently favourable sites in Yorkshire for this insect this is the first time that it has been recorded in the county.
- Orgyia antiqua* L. (Vapourer) (62) Pilmoor, one larva on 20/8/68; S.L.S. (63) Whitley Bridge, a larva taken on 8/9/68 did not produce a moth until October, a very late date; S.M.J. Larvae reached almost plague numbers along a Hawthorn hedge on Doncaster Racecourse in August 1968 (P. Skidmore). Appears to be scarcer than formerly; S.M.J.
- Leucoma salicis* L. (White Satin) (61) Driffield, one on 28/7/68; P.W. A rare species now in Yorkshire.
- Eilema lurideola* Zinck. (Common Footman) (61) Larvae common at Spurn; S.L.S.
- Colocasia coryli* L. (Nut Tree Tussock) (64) One taken at Barwick-in-Elmet near Leeds; R.H. Not recorded from this part of the county for very many years, the only recent reports of this insect having been from the Grassington and Pickering districts where it has occurred at light.
- Apatele alni* L. (Alder moth) (64) Scholes near Leeds, two on 16/6/68; S.L.S.
- Craniophora ligustri* F. (Coronet) (61) One near Driffield; P.W. A new locality for this very local species.
- Ammogrotis lucerneae* L. (Northern Rustic) (63) Birkenshaw near Bradford, one on 28/7/68; (W. Jagger); J.B. Also at Halifax; W.E.C.
- Spaelotis raveda* Hübn. (Stout Dart) (61) Spurn, two on 22/8/68; S.L.S.
- Eurois occulta* L. (Great Brocade) (63) Birkenshaw, one in 8/68; (W. Jagger); J.B. Apparently little movement of this migrant species during 1968 as this is the only record I have received.
- Hadena trifolii* Rott. (Small Nutmeg) (64) Scholes near Leeds, several in 8/68; S.L.S. Used to be fairly common, but rarely reported in recent years.
- H. nana* Hufn. (Light Shears) (64) One at Scholes; S.L.S. Though fairly common in the Malham and Grassington areas, this appears to be generally less widespread than formerly.
- Dryobotodes protea* Schiff. (Brindled Green) (64) Bramham, 29/8/68; J.H.F.
- Apamea ophiogramma* Esp. (Double Lobed) (61) Barlby, one on 29/7/68; S.M.J. (64) Scholes, one on 13/8/68; S.L.S.
- A. scolopacina* Esp. (Slender Brindle) (62) Pilmoor, one on 12/8/68; S.L.S. Not previously known from this district.
- Brachionycta sphinx* Hufn. (Sprawler) (61) Raincliffe Woods, adult on 31/10/68; P.W. (64) Wetherby, larva beaten from elm on 4/6/68; S.M.J. Whilst the status of many insects has changed over the years, the continued scarcity in Yorkshire of this moth is surprising as it occurs sometimes commonly in neighbouring counties. The very few records I have are all of single captures.
- Celaena leucostigma* Hübn. (Brown Crescent) (64) Scholes, 24/7/68; S.L.S.
- †*Arenostola fluxa* Hübn. (Mere Wainscot) (62) The first known Yorkshire specimen was taken in a locality north of York on 12/8/68, and a second, by the same captor, at Aberford (64) on 4/9/68; S.L.S. The second record is a very late date for this moth but many species have been late this year. It is interesting to speculate why this insect has not previously been taken in the county as there has been no lack of activity by members working suitable habitats. The occurrence of the two initial specimens in widely separated places is very curious; does it indicate recent colonisation, or that the species is a very local relict?
- Amphipyra pyramidea* L. (Copper Underwing) (63) Triangle, near Halifax; one taken on 9/9/68 was only the second for that district; W.E.C. (see *Naturalist*, 1965, p. 22).

- Zenobia subtusa* F. (Olive Kidney) (64) Scholes, one on 30/8/68; S.L.S. Not often reported.
- Omphalosceles lunosa* Haw. (Lunar Underwing) (64) Scholes, common on 6/9/68; S.L.S.
- †*Heliothis dipsacea* L. (Marbled Clover) (61) Muston near Filey, one at Ragwort bloom on 14/8/68; P.W. Porritt's guarded reference to this species having reputedly occurred in the county last century indicates his doubt regarding its authenticity. The present record however is well authenticated and I am regarding it as a new county record.
- Iodis lactearis* L. (Little Emerald) (61) Cliffe Common, a few during 8/68; S.M.J.
- Scopula ternata* Schrank (Smoky Wave) (61) Levisham, 15/6/68; S.M.J. (64) Washburndale, common on high ground on 16/6/68; C.C.S.
- Nophopteryx carpinata* Borkh. (Early Tooth-striped) (64) Askham Bog, 17/4/68; C.C.S.
- Lobophora halterata* Hufn. (Seraphim) (62) Strensall, 9/6/68; J.H.F. A very local species. (See *Naturalist*, 1966, p. 21.)
- Lygris pruinata* L. (Large Phoenix) (62) Ampleforth, 24/8/68; S.L.S. (63) Triangle near Halifax; W.E.C.
- Thera juniperata* L. (Juniper Carpet) (64) Harrogate, one on 15/10/68, and one on 22/10/68; Dr. Faulkner, per C.I.R. First record since Porritt; the moths may have been introduced with the foodplant from elsewhere, or it may be established on some allied garden shrub growing nearby. The two captures — a week apart — makes it more likely that they bred locally.
- Xanthorhoe munitata* Hubn. (Red Carpet) (64) 35 recorded in trap set up at Malham Tarn Field centre; J.B.
- Colostygia multistrigaria* Haw. (Mottled Grey) (64) Breary Marsh near Leeds, abundant on 30/3/68; C.C.S. A locally common insect.
- Euchoeca nebulata* (Scop) (Dingy Shell) (64) Bishop Wood 2/6/68; C.C.S. Also a few noted in another area near Selby in 6/68; S.M.J.
- Perizoma flavofasciata* Thunb. (Sandy Carpet) (64) Malham Tarn Field centre, 12–18/6/68; J.B. Not as common as one would expect, but now rather local.
- P. bifasciata* Haw. (Barred Rivulet) (61) Skipwith Common, 19/7/68; C.C.S. An interesting addition to my Skipwith list; the foodplant, Red Bartsia (*Odontites verna*), grows locally on the Common.
- Gymnoscelus pumilata* Hübn. (Double-striped Pug) (64) Malham Tarn Field centre, 7/68; J.B. Now very rare in Yorkshire, there being only one other recent record.
- Ennomos quercinaria* Hufn. (August Thorn) (61) Muston near Filey, 4/9/68; P.W. The only other recent records of this very local moth are from Pickering.
- Apocheima hispidaria* F. (Small Brindled Beauty) (64) Bishop Wood, again noted high up on Sycamore trunks on 26/3/68; J.B.
- Cataglyphis lemnaea* L. (64) Scholes, 13/8/68; S.L.S.
- Euxanthia zoeana* L. (61) Thriexdale, 21/7/68; S.M.J.
- Notocelia uddmanniana* L. (64) Selby, 31/7/68; S.M.J.
- Eucosma foenella* L. (61) Barlby, 21/7/68; S.M.J.
- Ypsolophus parenthesesellus* L. (61) Scarborough, 11/8/68; S.M.J.

BOTANY

(Dorothy R. Walker): The winter of 1967–8 was an average one with not too much snow and frost. Spring growth started early but, as so often happens, cold north winds followed with consequent slowing down of progress.

From the Thirk area icy winds are said to have restricted early growth. Flowering generally was late though good and fruiting was also good, but farm crops suffered severely from the storm of 2nd July.

Around Richmond, after promise of an early spring, cold weather retarded growth and spring flowering was late. Rowan, sloe, pear and apple flowered well and all set fruit but high winds in summer spoilt the apple crop. There has been damage by floods and our reporter says she has never before seen the Swale and Tees in spate so often in summer. Grass, hay and silage crops have all been good; hollies in the area have an excellent crop of berries and hazels plenty of nuts.

From upper Wharfedale our reporter comments on people's varied reactions to this summer; mostly they say good — even wonderful — which means they have had

little rain. But on the whole they have lacked sunshine since the three fine weeks of June. The deluge of 2nd July was not accompanied by hail in upper Wharfedale and there were no corn crops to suffer, whilst much of the hay was already in. Limes in Linton flowered at the end of June but set hardly any fruit. They flowered again profusely in the first week of August and have since set fruit.

At Ilkley the northerly winds made for a late start to flowering but the sunshine from the end of May to the third week of June made amends. There was a fine show of buttercups as they were unspoilt by rain. Most trees and shrubs flowered and fruited well. Elms in particular were full of fruits on 15th June and an exceptional profusion of elm fruits was reported from other parts of the county. During the thunderstorm of 2nd July a large ash tree by the road between Bolton Abbey and Barden was struck by lightning and pieces of bark were flung across the road and about fifteen yards into a field.

The Harrogate area suffered severely from the hail and rain storm of 2nd July. In a few minutes trees had their leaves shredded and some branches broken off; roses which were just coming into flower were stripped to bare and sometimes broken stems and herbaceous plants were pulverised. Many farmers had cornfields smashed and potato crops spoiled.

The Halifax area escaped the worst of the storm though a short distance away in the Elland and Brighouse areas much damage was done to trees, shrubs and other plants and here and in the Huddersfield district destruction of greenhouse crops through glass breakage was widespread. As at Ilkley, our reporter comments on an exceptionally fine display of buttercups in the Halifax district, the like of which he had never before seen. Oaks there have been noteworthy not only for their good crops of flower and fruit but for their unusual freedom from damage by the larvae of the Green Oak Moth (*Tortrix*). Lammas shoots were also vigorous. Trees generally, in the Halifax area, fruited well and bilberries bore a heavy crop with pickers more in evidence than for many years.

Apart from the three sunny weeks of June, the summer of 1968 will be remembered as a wet one. Over most of the county for most of the time it was either wet or dull and chilly with odd summer's days sandwiched in between grey or wet ones.

PLANT RECORDS: EAST RIDING (E. Crackles)

Two notable discoveries have been made in 1968: *Eleocharis uniglumis* occurs in two marshes between Wansford and Driffild, this being the first time the species has been recorded in the vice-county; and *Oenanthis fluviatilis* occurs in abundance along considerable stretches of the River Hull and not only in the two previously recorded localities along the river. Excursions to the Kirkham Abbey area early in the year, of the Bryological Section of the Y.N.U. and of the York and District Field Naturalists' Society resulted in the confirmation of old records for *Lathraea squamaria*, *Adoxa moschatellina* and *Cardamine amara*. Additional records for a large number of species which are rare or very local in East Yorkshire have been made this year and there has been a pleasing increase in the number of contributors. The inclusion of a grid-square reference indicates an addition to the distribution as recorded in the *Atlas*.

Polystichum aculeatum (L.) Roth. Kirkham Abbey woods 44/76; Mrs. F. Houseman (F.M.).

Ophioglossum vulgatum L. In chalk quarry, near Goodmanham 44/94; Miss P. Gardam: Wheldrake Ings; T. C. E. Wells: Cattleholmes, near Wansford; Miss E. Crackles (E.C.).

Clematis vitalba L. Old drove road, Elloughton; E.C.

Ranunculus sardous Crantz. Near Cottingham; D. Shimwell.

Ranunculus parviflorus L. Reighton Cliffs; E.C.

Fumaria parviflora Lam. Fordon; E.C.

Cardamine amara L. Kirkham; E.C. Confirmation of old record.

Myosoton aquaticum (L.) Moench. Near Melbourne; Y.N.U. Excursion.

Stellaria palustris Retz. Kelleythorpe 54/05, the only recent record for the River Hull valley; E.C.: near Melbourne; Y.N.U. Excursion.

Sagina nodosa (L.) Fenzl. Wintringham 44/87; T. C. E. Wells.

Montia fontana L. ssp. *chondrosperma* (Fenzl) Walters. Figham Common, Beverley; Beverley Naturalists comm. M. Taylor (M.T.), det. M. Walters.

Linum anglicum Mill. Near Thixendale; M.T.

Geranium sanguineum L. Near Londesborough 44/84; E. Wear.

- Geranium columbinum* L. Fordon 54/07; E.C.
Astragalus danicus Retz. Fordon 54/07; E.C.
Onobrychis viciifolia Scop. Fordon 54/07; E.C.
Saxifraga tridactylites L. Burdale; M.T.
Oenanthe fluviatilis (Bab.) Colem. In the River Hull, almost continuously from Hempholme Lock to Surf Dike 54/04 and 54/05, also for a considerable stretch above and below Corps Landing and at Bell Mills; E.C.
Primula veris x *vulgaris* = *P. variabilis* Goupil, non Bast. Kirkham; York Nats. Excursion: Wansford; E.C.
Samolus valerandi L. Leven Canal 54/04; E.C.
Blackstonia perfoliata (L.) Huds. Eppleworth; D. Shimwell.
Myosotis sylvatica Hoffm. Bell Mills, Driffeld; E.C.
Hyoscyamus niger L. Paull; R. Thistleton.
Lathraea squamaria L. Kirkham Abbey woods; F.H. and E.C. Confirmation of old record.
Pinguicula vulgaris L. Wintringham and Settrington, 44/87; E.C.
Legousia hybrida (L.) Delarb. Near Thorpe Bassett; E.C.
Galium mollugo x *G. verum* = *G. x pomeranicum* Retz. Near Wintringham, 44/87; E. Chicken.
Galium uliginosum L. Elmswell; E.C.
Adoxa moschatellina L. Kirkham Abbey woods; E.C. Confirmation of old record.
Paris quadrifolia L. Kirkham Abbey woods; F.H.
Gymnadenia conopsea (L.) R.Br. Fordon; E.C.
Orchis morio L. Near Nafferton; M.T. Between Beeford and Brandesburton; A. Washington, comm. M.T.
Orchis mascula (L.) L. Near North Newbald; E. Wear.
Dactylorhiza incarnata (L.) Vermeul. ssp. *pulchella* (Druce) H.-Harrison f. Kelley-thorpe; E.C.
Lemna gibba L. Near Melbourne; Y.N.U. Excursion.
 **Eleocharis uniglumis* (Link) Schult. (det. M. Walters) Two localities between Wansford and Driffeld, 54/05; E.C. New to East Yorkshire.
Carex hostiana DC. Kings Mill and North Newbald; E.C.
Carex hostiana x *C. lepidocarpa* = *C. x fulva* Gooden. Kings Mill, 54/05; E.C.
Carex vesicaria L. Near Melbourne, 44/74; Y.N.U. Excursion.
Carex acuta L. Near Melbourne; Y.N.U. Excursion.
Carex echinata Murr. Near Wintringham, 44/87; E.C.
Sieglingia decumbens (L.) Bernh. Kings Mill, Driffeld, 54/05 and Wintringham, 44/87; T. C. E. Wells and E.C.
Poa compressa L. Near Rotsea, 54/05 and at Elmswell, 44/95; E.C.
Glyceria declinata Bréb. Near Wintringham, 44/87; T. F. Medd.
Melica uniflora Retz. Near Haltemprice Priory, Cottingham; D. Shimwell.

WEST RIDING: (F. Murgatroyd)

Additional grid-square records for many widely distributed species make up the bulk of the records listed below. I have to thank Miss Lefevre and Mr. Skidmore for supplying most of these, from the Grassington and Doncaster areas respectively.

- Osmunda regalis* L. (63) Byram Park; R. F. Dickens. Probably introduced.
Blechnum spicant (L.) Roth (64) Round Hill, 44/96; H. Lefevre (H.L.).
Asplenium trichomanes L. (63) Wall at Old Haugh End, Sowerby, 44/12; F.M.
Ceterach officinarum DC. (64) On a wall at Hollins, Hampsthwaite, and on a wall at Birstwith, both in 44/25; C. Webb. New to Nidderdale.
Ranunculus lenormandii F. W. Schultz (64) Buckden Pike, 44/97, and Gate Up, Grimwith, 44/06; H.L.
Cardamine amara L. (64) Linton in Craven, by beck 44/96; H.L.
Silene vulgaris (Moench) Garcke (64) Railway at Linton in Craven, 44/96; H.L.
Stellaria graminea L. (64) Cockerham; Linton Moor Lane; Threshfield Beck, all 44/96; H.L.
Myosoton aquaticum (L.) Moench (63) Garden weed at Holmfield, Halifax, 44/02; F.M.
Lotus uliginosus Schkuhr (64) Cockerham, 44/96; Stickhaw, 44/06; H.L.
Trifolium medium L. (64) Linton Moor Lane, 44/96; H.L.
Lathyrus pratensis L. (64) Railway, Linton in Craven, 44/96; H.L.

- Peplis portula* L. (63) Blaxton Common, 44/60; Miss M. Shaw.
Epilobium adenocaulon Hausskn. (63) Crow Wood, 43/96; Miss M. Shaw.
Hydrocotyle vulgaris L. (64) Round Hill, 44/96; H.L.
Silaum silaum (L.) Schinz & Thell. (64) Hymans quarry, Low Bridge, Knaresborough; Mrs. F. Houseman.
Chaenorhinum minus (L.) Lange (63) Railway track, Denholme, 44/03; C. Hartley.
 (64) Railway, Linton in Craven, 44/96; H.L.
Euphrasia confusa Pugsl. (64) Roadside, Hanging Moor near Thruscross, and Duck Street quarries, Greenhow, both in 44/16; Mrs. F. Houseman.
Stachys palustris x *sylvatica* = *S. ambigua* Sm. (63) Stockmoor, 44/21; Y.N.U. Exc.
Veronica scutellata L. (63) Stockmoor; Y.N.U. Exc.
Hieracium decolor (W. R. Linton) A. Ley (64) Dib Scar, Conistone, 44/96; F. Houseman. This appears to be new to county.
Tamus communis L. (64) Round Hill, 44/96; H.L.
Orchis morio L. (64) Upper Dunsforth, 44/45; Mrs. D. Haythornthwaite.
Acorus calamus L. (64) Great Ouseburn, 44/46; Mrs. D. Haythornthwaite.
Eleocharis acicularis (L.) Roem. & Schult. (63) Blaxton gravel pits, 44/60; P. Skidmore.
Catabrosa aquatica (L.) Beauv. (63) Potteric Carr, 43/59; P. Skidmore.
Calamagrostis canescens (Weber) Roth (63) Sandall Beat Wood, Potteric Carr, Beeston Plantation, Bessacarr Carr, all in 43/59; P. Skidmore. Long known from the Potteric Carr area but omitted from the *Atlas*.
Alopecurus aequalis Sobol. (63) Blaxton gravel pits, 44/60; Miss M. Shaw 1966; P. Skidmore 1968.

NORTH RIDING: (C. M. Rob)

The number of records for the North Riding is well above average but most of these are for common plants which had been missed when the field work for the *Atlas* was in progress. All records listed below with grid square references are additions to the *Atlas*; these will be useful for the second edition of that work. Of the more interesting records, that of *Orobanche alba* from the Yoredale scars near Carperby in Wensleydale, is outstanding. The plant was first recorded from Wensleydale more than 100 years ago, but has not been seen for over 40 years. This year Dr. J. D. Lovis discovered a good colony on a steep slope below the main scars. A number of other likely-looking places were subsequently examined, with no success.

Cryptogramma crispa and *Myosotis brevifolia* have both been recorded from the Cotterdale - Great Shunner Fell square and are sufficiently rare to warrant inclusion in this report. *Chaenorhinum minus* is well known on railway ballast, but is not often seen in arable fields. There was a fair amount in a field near Snape where both *Stachys arvensis* and *Anthemis cotula* were abundant. The *Anthemis* is very uncommon in the North Riding. *Sagittaria* in the Derwent is an interesting extension of the known range of this plant in Yorkshire. *Carex boenninghausiana* near Helmsley is also a very interesting find and it is very surprising that *Carex pauciflora* should previously have been overlooked in the well-worked area of Fen Bog.

I am grateful to all who have sent records for the report; those of Mr. Medd for the York area and Mr. Simpson for the Forestry plantings have made up the majority of additions to the published 10 km. squares.

Initials of contributors: I. C. Lawrence, T. F. Medd, C. M. Rob, G. A. Shaw, G. Simpson, W. A. Sledge.

- Lycopodium clavatum* L. (62) Hasty Bank, Great Broughton, 45/50; I.C.L. Disused quarry, Stoupes Brow, Ravenscar, 45/90; G.A.S. Cawthorn Moor, 44/79; G.S.
 (65) Nutwith Common, Masham, 44/27; Y.N.U.
Selaginella selaginoides (L.) Link (65) Great Shunner Fell, 34/88; W.A.S.
Equisetum sylvaticum L. (62) Baker's Warren, 44/98; G.S.
Equisetum telmateia Ehrh. (62) Deepdale, 44/99; G.S.
Cryptogramma crispa (L.) R.Br. ex Hook. (65) Great Shunner Fell; G.A.S. Simonstone; Miss Lefevre.
Athyrium filix-femina (L.) Roth (62) Ireton Moor, 54/08; G.S.
Dryopteris borrieri Newm. (62) Ireton Moor, 54/08; G.S.
Helleborus viridis L. Deepdale, 44/99; G.S.
Ranunculus trichophyllus Chaix (65) Lake at Hornby Castle, 44/29; Y.N.U.
Ranunculus circinatus Sibth. (62) Near Kildale, 45/60; I.C.L.
Draba incana L. (65) Above High Shaw, 34/89 and Nappa Scar, 34/99; W.A.S.

- Cardamine amara* L. (62) Black Park, 44/79; G.S.
Polygala serpyllifolia Hose (62) Ireton Moor, 54/08; G.S.
Hypericum humifusum L. (62) Cropton, 44/78; G.S.
Arenaria serpyllifolia L. (62) Maw Rigg, 44/99; G.S.
Spergularia rubra (L.) J. & C. Presl (62) Cropton, 44/78; G.S.
Scleranthus annuus L. (62) Warthill, 44/65; T.F.M.
Linum catharticum L. (62) May Beck, 45/80; G.S.
Geranium dissectum L. (62) Cropton, 44/78; G.S.
Ononis repens L. (62) Murton, near Hawnby, 44/58; Y.N.U.
Potentilla palustris (L.) Scop. (62) Warthill Common, 44/65; T.F.M.
Potentilla anglica Laichard (62) Murton, nr. Hawnby, 44/58; Y.N.U.
Epilobium roseum Schreb. (62) Middlesbrough, 45/41; I.C.L.
Hippuris vulgaris L. (65) Hornby Castle, 44/29; Y.N.U.
Oenanthe fistulosa L. (62) Newby in Cleveland, 45/51; I.C.L.
Betula pendula Roth (62) Ness Head, 44/88; G.S.
Salix caprea L. (62) Ireton Moor, 54/08; G.S.
Erica tetralix L. (62) Ireton Moor, 54/08; G.S.
Vaccinium myrtillus L. (62) Ireton Moor, 54/08; G.S.
Menyanthes trifoliata L. (62) May Beck, 45/80; G.S.
Symphytum tuberosum L. (65) Nr. Ellerton on Swale, 44/29; C.M.R.
Myosotis brevifolia C. E. Salmon (65) Cotterdale; C.M.R.
Lithospermum officinale L. (62) Hutton Rudby, 54/40; I.C.L.
Solanum nigrum L. (62) Pickering, 44/88; G.S.
Chaenorhinum minus (L.) Lange (65) Snape, 44/28; C.M.R.
Scrophularia umbrosa Dumort. (65) Hornby Castle, 44/29; Y.N.U.
Digitalis purpurea L. (62) Bickley Moor, 44/99; G.S.
Veronica agrestis L. (65) Snape, 44/28; C.M.R.
Orobanche alba Steph. ex Willd. (65) Scars above Carperby, 34/99; Dr. J. D. Lovis.
Clinopodium vulgare L. (62) Hutton Rudby, 45/40; I.C.L.
Stachys arvensis (L.) L. (62) North Head, 44/99; G.S. (65) Snape, 44/28; Lady Ropner.
Campanula latifolia L. (62) Broxa Bank, 44/99; G.S.
Galium mollugo L. subsp. *erectum* Syme (62) Castle Howard, 44/77; T.F.M.
Galium mollugo x *verum* (G. x *pomeranicum* Retz.) (65) Downholme, near Richmond, 44/19; Mrs. J. Holloway.
Galium uliginosum L. (62) Warthill Common, 44/65; T.F.M.
Valeriana officinalis L. (62) Murton, nr. Hawnby, 44/58; Y.N.U.
Knautia arvensis (L.) Coult. (62) May Beck, 45/80; G.S.
Senecio aquaticus Hill (62) Newby in Cleveland, 45/41; I.C.L.
Anthemis cotula L. (65) Snape, 44/28; C.M.R.
Artemisia vulgaris L. (62) Newbridge Quarries, 44/88; G.S.
Hypochoeris radicata L. (62) Ness Head, 44/88; G.S.
Crepis paludosa (L.) Moench (62) Wintergill, 45/70; G.S.
Taraxacum laevigatum (Willd.) DC. (65) Hornby Castle, 44/29; Y.N.U.
Alisma plantago-aquatica L. (62) Sutherland Beck, 44/79; G.S.
Sagittaria sagittifolia L. (62) River Derwent near Charm Park, Wykeham, 44/98; Scarborough Field Nats. comm. Mrs. Lynes.
Potamogeton lucens L. (62) River Derwent, Norton, Malton, 44/77; T.F.M.
Epipactis helleborine (L.) Crantz (63) Flainsey Rigg, 44/88; G.S.
Listera ovata (L.) R.Br. (65) Hornby Castle, 44/29; Y.N.U.
Orchis ustulata L. (62) Gundale, Pickering, 44/88; J. Armitage & A. Norris.
Dactylorhiza maculata (L.) Vermeul. (62) Deepdale, Murton, 44/58; Y.N.U. May Beck, 45/80; G.S.
Lemna trisulca L. (65) Hornby Castle, 44/29; Y.N.U.
Carex binervis Sm. (62) Ireton Moor, 54/08; G.S.
Carex lepidocarpa Tausch (65) Hornby Castle, 44/28; Y.N.U. Haw Bank, nr. Carperby, 34/99; C.M.R.
Carex pseudocyperus L. (62) Planted in Castle Howard Park, 44/77; T.F.M.
Carex rostrata Stokes (65) Hornby Castle, 44/29; Y.N.U.
Carex pilulifera L. (62) Ireton Moor, 54/08; G.S.
Carex paniculata x *remota* (C. x *boeninghausiana* Weihe) (62) Near River Rye, Duncombe Park, 44/58; Mrs. D. Blair.
Carex spicata Huds. (62) Ruffa Lane, 44/88; G.S.

- Carex pauciflora* Lightf. (62) Fen Bog, a few plants; C.M.R.
Poa nemoralis L. (62) Wrea Head College, 54/09; G.S. (65) Kirklington, 44/38; C.M.R.
Catabrosa aquatica (L.) Beauv. (62) Duncombe Park, 44/58; Mrs. D. Blair.
Deschampsia flexuosa (L.) Trin. (62) Warthill Common, 44/65; T.F.M.
Agrostis gigantea Roth (65) Kirklington, 44/38; C.M.R.
Holcus mollis L. (62) Ireton Moor, 54/08; G.S.

ALIENS AND CASUALS: (Mrs. F. Houseman)

Several members continue to take a keen interest in aliens and have recorded that some plants have become established and a few persist for a year or two. Present-day methods of tipping are not favourable for much plant growth especially on the wool dumps. Many established aliens may be seen in the wilder parts of the gardens of stately homes and near abbeys.

The following have kindly sent records: Mrs. J. E. Duncan, C. Hartley, Miss R. Kilby, I. C. Lawrence, T. F. Medd, F. Murgatroyd, Dr. G. A. Nelson, J. Oxtoby, Miss C. M. Rob, G. A. Shaw, H. D. Sutcliffe, Miss M. Taylor, J. A. Vaughan.

- Rapistrum rugosum* (L.) All. (62) Waste land, Middlesbrough; I.C.L.
Coronopus didymus (L.) Smith (64) Building site, Ilkley; J.E.D.
Thlaspi arvense L. (64) Waste ground, Ilkley; J.E.D.
Sisymbrium orientale L. (64) Waste ground, Ilkley; J.E.D.
Malcolmia maritima R. Br. (62) Barley field near Pickering; J.A.V.
Erysimum cheiranthoides L. (64) Riverside, Scarborough Bridge, York; T.F.M.
Reseda lutea L. (64) Abundant in gravel pits, Ben Rhydding; J.E.D.
Claytonia alsinoides Sims (62) Bottom Hall, Danby (N.Z. 60); Mrs. F. H. Bell com. C.M.R.

- Chenopodium ficifolium* Smith (62) Waste land, Middlesbrough; I.C.L.
C. capitatum (L.) Aschers. (64) In sheep pen on farm, Otley; Miss A. M. Lister per F.H.

- Geranium endressii* x *versicolor* (62) Castle Howard Park (S.E. 76); T.F.M.
Melilotus officinalis (L.) Pallas (64) Cowpasture Road, Ilkley; J.E.D.
M. indica (L.) Allioni (64) Allotment, Holgate Road, York; T.F.M.
Trifolium incarnatum L. (63) One plant, Halifax Sewage Tip; R.K.
T. glomeratum L. (63) With above; F.H.
T. hirtum All. (63) (det J.E.L.) Several plants with above; F.H.
T. tomentosum L. (64) (det D. McC.) Waste ground, Ilkley; J.E.D.
Coronilla varia L. (63) Sowerby Bridge Tip; F.M. Railway bank, Long Sandall Lock, 44/60; G. Oates.
Lathyrus aphaca L. (62) Railway bank, Middlesbrough; I.C.L. (63) Garden weed, Guiseley; H.D.S.

- L. tuberosus* L. (61) Staxton; Miss Robson per Miss M. Taylor.
Epilobium nerteroides Cunn. (62) Caydale Mill (S.E. 58); Y.N.U. (64) Pecca Falls and Thornton Force, near Ingleton; F.H. (65) Hardraw Force; F.H.
Saxifraga cymbalaria L. (64) Newby Hall grounds; F.H.
Oenothera erythrosepala Borbas (64) Martins Bank car park, Otley; F.H. Hymas's quarry, Knaresborough; F.H.

- Polygonum lapathifolium* L. (64) Waste ground, Ilkley; J.E.D.
Alnus incana (L.) Moench (65) Hornby Castle (S.E. 29); Y.N.U.
Calystegia sepium x *sylvatica* (63) Old Lane, Halifax; Dr. G. A. Nelson.
Mimulus moschatus Lindley (63) Increasing near Dewsbury; C.H.
Lamium maculatum L. (63) Abundant, old rail embankment, Guiseley; J.O.
Veronica filiformis Smith (62) Castle Howard Park; T.F.M. (64) Riverbank, Hartlington Raikes; F.H. Abundant at Leathley Corn Mill; G.A.S.

- Lonicera xylosteum* L. (62) Hornby Castle (S.E. 29); Y.N.U.
Artemisia absinthium L. (64) Cowpasture Road and Rupert Road, Ilkley; J.E.D.
Grindelia squarrosa (Pursch) Dunal. (det J.E.L.) (62) Nr. Whitby Docks; J.A.V.
Carthamus tinctorius L. (63) Halifax Sewage Tip; F.M.
Cichorium intybus L. (62) Roadside near Eston; I.C.L. Flatts Lane, Normanby, 45/51; I.C.L. (64) Grammar School field, Ilkley; J.E.D.
Lolium temulentum L. and *Echinochloa crus galli* (L.) Beauv. (63) Sowerby Bridge; F.M.
Hordeum pubiflorum Hook. (63) Halifax Sewage Tip; R.K.

BRYOLOGY

HEPATICAE: (F. E. Branson)

In this report I have included all the V.C. records together with a small handful of other records of interest made in various parts of the county. There are 22 vice-county records given below, a large proportion of them having been made at the joint meeting with the British Bryological Society.

Early in April 1965 I visited the limestone quarries at Burton Leonard (V.C. 64) in company with Mrs. J. A. Paton where we gathered an hepatic new to Britain, *Lophozia perssonii* Buch & S. Arnell. The day after, it was again found in Jackdaw Crag Quarry near Tadcaster (V.C. 64) by Mrs. Paton in company with Miss Dalby. I have seen it in both locations. There is a full account of this species in the *B.B.S. Transactions*, Vol. 5, part 3, 1968 by J. A. Paton and H. J. B. Birks.

Another species which has come under notice is *Riccia crystallina* L. It has been discovered that most of the material determined as this species in England is, in fact, *Riccia cavernosa* Hoffm. (see Mrs. Paton's paper in *B.B.S. Transactions* Vol. 5, part 2, 1967). Mrs. Paton has seen most of the Yorkshire specimens and has re-determined them as *R. cavernosa*. As all the Yorkshire material is probably referable to *R. cavernosa*, it is thought best to delete all the entries of *R. crystallina* from the record book and record them as *R. cavernosa*.

† denotes new county record

* new vice-county record.

- *44/39 *Anthoceros punctatus* L. (65) Stubble field nr. Little Langton Grange, Thrintoft, Sept. 1967; J. A. Paton, B.B.S.exc.
- *44/79 *Preissia quadrata* (Scop.) Nees (62) Wheeldale Moor, July 1954; J. Appleyard.
Riccia cavernosa Hoffm. Records have been confirmed for V.C.'s (61) and (64)
- 44/54 *Ricciocarpus natans* (L.) Corda (64) Pond nr. Catterton Wood, Tadcaster, May 1967; D. R. Walker.
- *44/71 *Riccardia incurvata* Lindb. (63) Edge of pond on clay, Thorne, Sept. 1967; G. A. Shaw.
- *44/47 *R. sinuata* (Dicks.) Trev. (65) Ditch nr. Throstle Nest, Leckby, Sept. 1967; Paton & Horrill, B.B.S.exc.
- *45/50 *R. palmata* (Hedw.) Carruth. (62) Vertical rock, N. of Greenhow Moor, Sept. 1967; J. Appleyard, B.B.S.exc.
- *44/79 *Pellia neesiana* (Gottsche.) Limpr. (62) Old ironstone mine, Spaunton Moor, Rosedale, Sept. 1967; J. A. Paton, B.B.S.exc.
- 44/16 *P. neesiana* (Gottsche.) Limpr. (64) Merryfield Glen, Pateley, Oct. 1967; F. E. Branson.
- †44/47 *Fossombromia incurva* Lindb. (62) Disused railway line, Pilmoor, Sept. 1967; J. A. Paton, B.B.S.exc. New to England.
- *45/70 *Hygrobiella laxifolia* (Hook.) Spruce (62) On stones, West Arnecliff Wood, Glaisdale, Sept. 1967; Paton & Duckett, B.B.S.exc.
- *44/76 *Ptilidium pulcherrimum* (Weber) Hampe (61) On willow, Kirkham Abbey Wood, April 1968; M. Dalby, Y.N.U.exc.
- *45/70 *Calypogeia neesiana* var *meylanii* (Buch) Schuster (62) Sandstone rocks, West Arnecliff Wood, Glaisdale, Sept. 1967; Paton & Duckett, B.B.S.exc.
- †35/82 *Lophozia obtusa* (Lindb.) Evans (65) Birch wood between High Force and Holwick Bridge, Teesdale, Oct. 1967; G. G. Graham & D. W. Shimwell.
- †44/36 *L. perssonii* Buch & S. Arnell (64) On earth, Burton Leonard quarries, April 1965; Paton & Branson. New to Britain.
- 44/05 *Leicolea muelleri* (Nees) Jörg. (64) Rocks near Strid, Bolton Woods, Jan. 1968; F. E. Branson.
- †35/82 *L. heterocolpos* (Thed.) Buch (65) Crevices in dolerite rocks, Holwick Bridge, Teesdale, Sept. 1967; Duckett. New to England.
- 44/35 *Solenostoma sphaerocarpoidea* (De Not) Paton & Warb. (64) Cliffs between Low Bridge and Birkham Wood, Knaresborough, Nov. 1967; F. E. Branson.
- *45/70 *Plectocolea paroica* (Schiffn.) Evans (62) Rocks by R. Esk, East Arnecliff Wood, Glaisdale, Sept. 1967; Appleyard et al., B.B.S.exc.
- *44/04 *P. paroica* (Schiffn.) Evans (64) Stream bank, Silsden, Aug. 1953; J. Appleyard.
- *44/76 *Plagiochila asplenoides* var *major* Nees (61) Kirkham Abbey Wood, April 1968; M. Dalby, Y.N.U.exc.
- *45/70 *Harpanthus scutatus* (Web. & Mohr) Spruce (62) Shaded sandstone rocks, West Arnecliff Woods, Glaisdale, Sept. 1967; Paton & Duckett, B.B.S.exc.

- *44/47 *Odontschisma denudatum* (Mart.) Dum. (62) With *Calluna* on damp peat, Pilmoor, Sept. 1967; A. C. Crundwell, B.B.S.exc.
- 44/05 *Scapania cuspiduligera* (Nees) K. Mull. (64) Rocks near Strid, Bolton Woods, Sept. 1967; J. G. Duckett.
- *44/79 *S. scandica* (Arn. & Buch) Macv. (62) Stone in old ironstone mine, Spaunton Moor, Rosedale, Sept. 1967; J. A. Paton, B.B.S.exc.
- 44/25 *S. irrigua* (Nees) Dum. (64) Cart rut off Penny Pot Lane, Harrogate, July 1968; F. E. Branson.
- 44/05 *S. aequiloba* (Schwaegr.) Dum. (64) Rocks by R. Wharfe, Bolton Woods, Jan. 1968; G. A. Shaw.
- *44/58 *S. aspera* Bernet (62) Shaded calcareous boulders below Roulston Scar, Sept. 1967; J. A. Paton, B.B.S.exc.
- *45/70 *Lejeunea cavifolia* (Ehrh.) Lindb. (62) Shaded riverside rocks East Arnecliffe Wood, Glaisdale, Sept. 1967; J. A. Paton, B.B.S.exc.
- 44/05 *L. patens* Lindb. (64) Cliffs near Strid, Bolton Woods, Jan. 1968; G. A. Shaw.
- Nomenclature follows the *Census Catalogue of British Hepatics*, J. A. Paton, 1965.

MUSCI: (M. Dalby):

There is an exceptionally long list of county and vice-county records this year thanks to the B.B.S. meeting at Northallerton in September 1967 and a most successful meeting of the Y.N.U. bryological group at Kirkham Abbey in April 1968. Both these reports have been published elsewhere in *The Naturalist*.

Other interesting records include Mr. G. A. Shaw's discovery of *Tetraplodon mnioides* (Hedw.) B. & S. with fruit, on a dead sheep near the Wolf Stones on Haworth Moor (63) in May 1968. There is only one other previous record for this species in V.C. 63, that of W. H. Burrell from Ellentree Clough, Holme, in 1928. Mr. Shaw also found *Pohlia elongata* Hedw. on Barkin Fell, Barbondale (65) in April this year. Also in April an expedition to Goyden Pot in Upper Nidderdale (64) by Mr. Shaw and Mr. Branson produced an interesting list of species including *Orthothecium intricatum* (Hartm.) B.S. & G., *Pohlia cruda* (Hedw.) Lindb., *Seligeria recurvata* (Hedw.) B.S. & G. and *Rhynchostegiella pumila* (Wils.) E. F. Warb. In November 1967 *Sphagnum subsecundum* var. *subsecundum* Nees, a comparatively rare variety of this group, was found in Merryfield Glen, Nidderdale (64) by Mr. Branson and myself.

- *44/76 *Fissidens minutulus* var. *minutulus* Sull. (61) Kirkham Abbey Wood, April 1968; E. Crackles, Y.N.U.exc.
- *44/79 *Distichium inclinatum* (Hedw.) B.S. & G. (62) Old ironstone mine, Spaunton Moor, Rosedale, Sept. 1967; J. A. Paton, B.B.S.exc.
- *45/50 *Dicranella subulata* (Hedw.) Schimp. (62) Greenhow Moor, Sept. 1967; A. C. Crundwell, B.B.S.exc.
- *44/58 *Dicranum strictum* Schleich. ex Schwaegr. (62) Little Gormire, Sept. 1967; J. Appleyard, B.B.S.exc.
- *44/47 *D. polysetum* Michx. (62) Pilmoor, Sept. 1967; Duckett, Paton & Crundwell, B.B.S.exc.
- *44/47 *D. spurium* Hedw. (62) Pilmoor, Sept. 1967; Duckett, Paton & Crundwell, B.B.S.exc.
- *44/85 *Aloina brevirostris* (Hook. & Grev.) Kindb. (61) Greenwick Dale, Huggate, Aug. 1967; J. Robertson.
- †44/05 *Cinclidotus mucronatus* (Brid.) Mach. (64) Rocks near the Strid, Bolton Woods, Sept. 1967; Duckett, Bell & Evans.
- *44/87 *Barbula vinealis* Brid. (61) Thorpe Basset, Malton, April 1960; Crowson.
- *44/76 *Trichostomum sinuosum* (Mitt.) Lindb. ex Herzog (61) Kirkham Abbey, April 1968; F. E. Branson, Y.N.U.exc.
- †45/50 *Coscinodon cribrus* (Hedw.) Spruce (62) Greenhow Moor, Sept. 1967; Duckett & Lobley, B.B.S. exc.
- *44/76 *Grimmia trichophylla* Grev. (61) Kirkham Abbey, April 1968; M. Dalby, Y.N.U.exc.
- *44/39 *Physcomitriella patens* (Hedw.) B.S. & G. (65) Little Langton Grange, Thrintoft, Sept. 1967; J. A. Paton, B.B.S.exc.
- *44/49 *Ephemerum serratum* (Hedw.) Hampe (62) N. of Osmotherley, Sept. 1967; J. A. Paton, B.B.S.exc.
- *44/34 *Bryum micro-erythrocarpum* C.M. & Kindb. (64) Between Spofforth and Wetherby, Sept. 1967; J. Appleyard.

(continued on p. 30)

NATURALISTS' UNION

Year to 30th September, 1968

INCOME

1967	£	s.	d.							£	s.	d.
734	13	1		Subscriptions and Donations	...	...	...	...	...	707	3	5
141	5	5		Life Members	...	...	...	...	...	15	0	0
103	9	6		Income Tax on Covenants	...	...	...	...	...	142	11	0
7	18	1		Bank Interest and Dividends	...	...	...	...	...	93	17	5
—	—	—		Sale of Publications	...	...	...	...	...	51	19	6
—	—	—		Dollar Adjustment	...	...	...	...	...	3	8	

CHISLETT MEMORIAL FUND:

Balance brought forward	...	271	17	7
Interest received	...	8	6	2

Less cost of Third Lecture	...	280	3	9
		78	6	2

Balance		201	17	7
---------	--	-----	----	---

£987 6 1

£1010 15 0

at 30th September, 1968

£	s.	d.		£	s.	d.	£	s.	d.	£	s.	d.
			INVESTMENTS (at cost):									
			ORNITHOLOGICAL ACCOUNT:									
			Nicholas Fund 3% Brit. Transport	...	100	0	0					
			Chislett Legacy, £600:									
			Treas. Stk. 5½% 2000/12	...	545	9	0					
			Treas. Stk. 5% 1986/89	...	501	17	0					
								1147	6	0		
			GENERAL ACCOUNT:									
			Booth Fund 3½% Conversion Stock	...	100	0	0					
			Cheesman Fund 3½% War Stock	...	100	0	0					
			4% Consols (Bank of England)	...	200	0	0					
			4% Consols (Post Office)	...	159	10	11					
			300 Unilever Ordinary Shares	...	522	1	6					
			250 Shell Trans. Ord. Shares	...	511	7	0					
								1592	19	5		
								2740	5	5		
			Less Reserve for Depreciation	...				235	0	0		
2505	5									2505	5	5
			BANK ACCOUNTS:									
			York County T.S.B.	...				449	8	3		
			Westminster Bank Current A/c.	...				310	16	8		
			Westminster Bank Deposit A/c.	...				253	10	8		
608	2	6										
										1013	15	7
			SUNDRY DEBTORS:									
			Income Tax Repayable on Covenants	...				142	11	0		
			Sundries including Accrued Interest	...				40	14	10		
239	2	1										
										183	5	10

£3352 10 0

£3702 6 10

THE YORKSHIRE PROFIT AND LOSS ACCOUNT

EXPENDITURE

1967 £ s. d.	GENERAL PRINTING:	£ s. d.	£ s. d.
84 15 3	Circulars	58 9 3	
32 10 0	Members' Cards	36 0 0	
			94 9 3
72 15 0	List of Members		
659 1 6	<i>The Naturalist</i>		757 9 9
	SUNDRY EXPENSES:		
41 12 2	Officers Expenses	34 15 7	
19 18 1	Duplicating and Stationery	5 14 9	
8 14 9	Bank Charges	14 11 6	
3 2 0	Subscriptions and Donations	3 3 0	
35 10 9	Cost of News Letters	50 0 0	
			960 3 10
29 6 7	Profit	50 11 2	

£987 6 1

£1010 15 0

BALANCE SHEET as

£ s. d.	ACCUMULATED FUNDS — GENERAL	£ s. d.	£ s. d.
	Booth Fund	100 0 0	
	Cheesman Fund	100 0 0	
	R. C. Fowler Jones Legacy	250 0 0	
	E. G. Bayford Legacy	100 0 0	
	R. Chislett Legacy	500 0 0	
1050 0 0			1050 0 0
	ANONYMOUS FUND		250 0 0
	MYCOLOGICAL FUND:		
	Balance Brought Forward	147 15 9	
	Add Sales <i>Cortinarius</i>	23 0 8	
147 15 9			170 16 5
1147 6 0	ORNITHOLOGICAL FUND — Capital Revenue:		1147 6 5
	Balance Brought Forward	111 2 1	
	Interest on Investments	66 0 0	
111 2 1			177 2 1
	LIFE MEMBERS' ACCOUNT:		
	Balance Brought Forward	122 15 0	
	Less Transfer Subscription Account	15 0 0	
122 15 0			107 15 0
	PROFIT AND LOSS ACCOUNT:		
	Balance Brought Forward	748 16 2	
	Add Profit	50 11 2	
748 16 2			799 7 4
24 15 0	SUNDRY CREDITORS		

AUDITORS' REPORT

We have audited the foregoing Income and Expenditure Account and Balance Sheet of the Yorkshire Naturalists' Union with the books, records and vouchers produced to us and certify the same to be in accordance therewith and with the information and explanations we have received.

WHITHAM, SMITH, MITCHELL & CO.,

Chartered Accountants,

4-6 Harrison Road,
Halifax.

31st December, 1968.

£3352 10 0

£3702 6 10

NATURALISTS' UNION

Year to 30th September, 1968

INCOME

1967 £ s. d.	Subscriptions and Donations	£ s. d.
734 13 1	Life Members	707 3 5
141 5 5	Income Tax on Covenants	15 0 0
103 9 6	Bank Interest and Dividends	142 11 0
7 18 1	Sale of Publications	93 17 5
	Dollar Adjustment	51 19 6
		3 8

CHISLETT MEMORIAL FUND:

Balance brought forward	271 17 7
Interest received	8 6 2

280 3 9
Less cost of Third Lecture

Balance 201 17 7

£987 6 1

£1010 15 0

at 30th September, 1968

£ s. d.	INVESTMENTS (at cost):	£ s. d.	£ s. d.	£ s. d.
	ORNITHOLOGICAL ACCOUNT:			
	Nicholas Fund 3% Brit. Transport	100 0 0		
	Chislett Legacy, £600:			
	Treas. Stk. 5½% 2000/12	545 9 0		
	Treas. Stk. 5% 1986/89	501 17 0		
			1147 6 0	
	GENERAL ACCOUNT:			
	Booth Fund 3½% Conversion Stock	100 0 0		
	Cheesman Fund 3½% War Stock	100 0 0		
	4% Consols (Bank of England)	200 0 0		
	4% Consols (Post Office)	159 10 11		
	300 Unilever Ordinary Shares	522 1 6		
	250 Shell Trans. Ord. Shares	511 7 0		
			1592 19 5	
			2740 5 5	
	Less Reserve for Depreciation	235 0 0		
2505 5				2505 5 5
	BANK ACCOUNTS:			
	York County T.S.B.	449 8 3		
	Westminster Bank Current A/c.	310 16 8		
	Westminster Bank Deposit A/c.	253 10 8		
608 2 6			1013 15 7	
	SUNDRY DEBTORS:			
	Income Tax Repayable on Covenants	142 11 0		
	Sundries including Accrued Interest	40 14 10		
239 2 1			183 5 10	

£3352 10 0

£3702 6 10

- *44/58 *B. bornholmense* Winkelm & Ruthe (62) Big Wood, Thimbleby, Sept. 1967; A. C. Crundwell, B.B.S.exc.
- *44/83 *B. rubens* Mitt. (61) North Cave, Dec. 1966; F. Bell.
- *44/49 *B. ruderales* Crund. & Nyh. (62) Cotcliffe Wood, Sept. 1967; A. C. Crundwell, B.B.S.exc.
- *44/83 *B. violaceum* Crund. & Nyh. (61) North Cave, Dec. 1966; F. Bell.
- *45/50 *B. violaceum* Crund. & Nyh. (62) Ingleby Greenhow, Sept. 1967; Crundwell & Appleyard.
- *44/58 *Mnium rugicum* Laur. (62) Gormire Lake, Sept. 1967; J. A. Paton, B.B.S.exc.
- *44/92 *Thamnum alopecurum* (Hedw.) B.S. & G. (61) Elloughton, Dec. 1966; F. Bell.
- *54/24 *Brachythecium salebrosum* (Web. & Mohr.) B.S. & G. (61) Kelsey Hill, Keyingham, July 1955; J. Appleyard.
- *44/58 *Isoeterygium seligeri* (Brid.) Dix. ex C. Jens. (62) Tup Hag Wood, Hawnby, Sept. 1967; Duckett, Evans & Bell, B.B.S.exc.
- *44/76 *I. depressum* (Bruch) Mitt. (61) Kirkham Abbey Wood, April 1968; F. E. Branson, Y.N.U.exc.
- *44/76 *Plagiothecium denticulatum* (Hedw.) B.S. & G. (61) Kirkham Abbey Wood; F. E. Branson, Y.N.U.exc.
- *44/58 *P. curvifolium* Schlieph. ex Limpr. (62) Roulston Scar; J. Robertson, B.B.S.exc.
- *44/76 *P. succulentum* (Wils.) Lindb. (61) Kirkham Abbey Wood, April 1968; M. Dalby, Y.N.U.exc.

Nomenclature from the *Census Catalogue of British Mosses*, 3rd edition, E. F. Warburg, 1963.

DONALD F. WALKER (1915-1968)

News of the sudden death on 20th September 1968 at the age of 53 of Donald F. Walker came as a great shock to his many friends in the Union and more particularly perhaps to those of us who had spent the previous weekend in his company at York University at the joint Y.N.U.-Y.N.T. Conference on 'The Changing Face of Yorkshire'. Then, he had been apparently in excellent health and in good spirits. Throughout the arranging of this most important and enjoyable conference he had taken a very active role and as the culmination of his share of all the months of planning was very much at the core of things during the actual event; present (like the Trust's secretary) where and whenever needed, bringing light relief with his own particular brand of humour and in general acting the gay and perfect host. On this occasion, too, he was discussing with me aspects not only of future Union activities, but also of his own personal future plans which were a matter of some concern to him at the time. Little did one imagine then that the future for him was to be of such short duration.

D.F.W. was educated at Bradford Grammar School and had subsequently been employed by the Musgrave Estates Company, of which until comparatively recently he was company secretary. He had been a member of Bradford Naturalists' Society since December 1942, their ornithological recorder continuously since 1950, and President in 1952-3 and again in 1960-1. It was on joining the Bradford Naturalists' in the mid-1940's that I first met Donald, since when we had shared holiday visits to the Cairngorms and Spurn, and met at numerous Y.N.U. sectional, business and field meetings. He had an almost boyish sense of fun, while at the same time displaying a more serious side in his studies and an acute sense of responsibility where official duties were concerned. He had joined the Y.N.U. in 1945. At the first Ornithological Section elections which I can recall, he was already a representative on the Union Executive. From 1965 to the time of his death he was Chairman of the Executive. Only the second person to fill this position, he proved to be an ideal choice. He had been one of the most regular of Vertebrate Section members in his attendance at field meetings.

With a wide range of natural history interests, he was a frequent and popular lecturer to local societies, schools (including his own old school) and other organisations. The benefits to the Union of these activities are impossible to estimate. He had the affairs of the Union very much at heart and his share in Union activities extended into a family participation. We came to know his wife and two children almost as well as we knew Donald himself. In their loss, and ours, the Union extends to Audrey, Angela and Richard a sincere deep-felt sympathy.

R. F. DICKENS

BOOK REVIEWS

Vanishing Animals of the World by **Richard Fitter**, illustrated by John Leigh Pemberton. Pp. 144, with 43 coloured plates and 29 line drawings and numerous maps. Midland Bank in association with Kaye and Ward, 1968. 30/-.

The production of this book deserves consideration even before the contents are reviewed. First of all, it is a landmark in natural history publication in Britain in that the royalties go to the British Appeal of the World Wildlife Fund, and also in the approach that it takes. Here is a beautiful book — 'a pleasure to own' as the dust-jacket rightly says, lavishly illustrated and handsomely bound, offered at the low price of thirty shillings. This has been achieved by the support of the Midland Bank, whose calendars and advertising have pleaded the cause of conservation for some years. The Duke of Edinburgh in his foreword, and Peter Scott in his introduction, acknowledge the debt of conservationists to the Midland Bank, and one can but echo their words in hoping that this book has the success it deserves.

In content, this is a book on mammals — those which appear in the Red Data Book of the International Union for the Conservation of Nature. These are all in danger of extinction and three hundred and seventy species are listed in the appendix to the book (270 considered officially in danger). The main body of the text is a continent by continent review of these vanishing mammals, and Richard Fitter's text is a masterpiece of conciseness combined with readability. The whole story shows how a number of factors may have worked against various species and their habitats, but this is not a saga of unrelieved gloom. There are chapters on animals which have been saved, such as the Sea Otter and the American Bison, and on how other species could be saved, by translocation, captive breeding and timely legislation.

The illustrations are, of course, a great feature of this work and form a unique gallery of rare animal pictures. Some of the colour reproductions will be familiar to those who study calendars on their visits to the Bank, but the black and white sketches have a great deal of charm also. Each of the forty-three colour plates is accompanied by a distribution map of the species concerned, and there are also maps indicating the origins of the species listed in the appendix.

It would be pointless here to try and deal in depth with the species covered, but if you have not already heard of the Chatham Island Rice Rat or the Bactrian Wapiti or many others, you will if you buy this book. T.M.C.

Animal Life in Europe. The Naturalist's Reference Book. By **J. Graf**. Pp. 595 with 16 plates and numerous text figures. Frederick Warne, 1968. 75/-.

The British tourist in Europe, interested in natural history, has for a long time been better served by the handbooks to plants than by those dealing with animals. Dr. Graf's book goes far to restore the balance. Originally designed for European readers it is now translated and published in the English version. The problem of selection in any book designed to cover all the animal groups in Europe is an enormous one and the criteria of selection must vary from group to group. In this book of almost 600 pages, half is devoted to the vertebrates, 45% to the arthropods and 5% to molluscs and worms. The vertebrates are treated in considerable detail and the reader has a good chance of identifying any vertebrate to species by the use of this handbook alone. A brief description of each species is given with notes on habit, habitat and distribution. An additional and particularly attractive feature of the book is the inclusion of sections dealing with mammal tracks and droppings, birds' nests, feeding places and pellets and an appendix of 35 pp. on the identification of bird songs. The invertebrate half of the book is organised partly on a taxonomic and partly on a habitat basis. Molluscs, worms and spiders are each dealt with as compact taxonomic sections. So too are the Lepidoptera, although their subdivisions into 'colourful butterflies of the open country', 'colourful butterflies of woodlands and parks', 'inconspicuous butterflies and moths', etc., are less helpful for quick reference. Other sections are grouped on a habitat basis such as insect larvae living underground, the leaf miners, domestic pests, galls, etc., and these are designed and will succeed in not only allowing quick reference to the name of the animal but to the knowledge of other kinds of animals likely to be found associated with it.

The text is concise and adequate and a notable feature, and one adding immeasurably to the usefulness of the book, is the illustrative material comprising excellent marginal drawings of the animals averaging almost four per page, as well as 16 full-page plates, 14 of which are in colour. E.B.

Bird Navigation by **G. V. T. Matthews**. Pp. x + 197 with 40 text figures. Cambridge Monographs in Experimental Biology No. 3. Cambridge University Press, Second Edition, 1968. £2.

A comparison of this second edition with the original in 1955 shows how much the subject has developed and grown in scientific stature in the last thirteen years with the introduction of new and sophisticated experimental techniques. This has necessitated the re-writing of the text completely, and as Dr. Matthews points out in his new preface, over half the bibliography is of selected new work which has appeared since the previous edition. The book is an excellent review of both the work done in this field and the theories currently advanced in the subject.

To those versed in the theory and practice of navigation, the experimental analysis and testing of such theories as inertial navigation, navigation by geophysical grids, astronomical grids and a grid derived from the sun's co-ordinates will be fascinating, but the average reader interested in bird migration will find it heavy going.

I.W.

The Book of Bird-Watching by **R. M. Lockley**. Pp. 127 with 21 black and white photographs and several line illustrations. Arthur Barker Ltd., 1968. 25/-.

As one would expect from a writer whose published books are about thirty in number and who has made many original contributions to our knowledge of birds, this book is both readable and informative. Aimed mainly at the beginner, it nevertheless outlines many sophisticated techniques including radar tracking, while more experienced bird-watchers could well learn something about bird psychology and physiology from it. Covering such a wide field in a comparatively small compass the author has, of necessity, had to be brief. In a few instances one feels that, keeping in mind that the book is primarily a guide for the beginner, a little further explanation would have been advantageous. Statements such as 'Birds have a poor sense of smell' are not particularly helpful unless comparisons are made or standards quoted. Fortunately the lucidity of the writing is of a high order and very few are the passages that leave room for any misunderstanding or misinterpretation.

The photographs vary in their quality and value as illustrations, but the line drawings are very satisfactory in both respects. One small error I would like to correct: it is not necessary as the author says, to apply to the Nature Conservancy for a permit to photograph birds at the nest. One only needs to do so if the species to be photographed is on the list of those receiving special protection.

This is a book that can be thoroughly recommended, not only for beginners, but to those bird-watchers who wish to be able to refer quickly to a summary of modern knowledge and thought on almost anything from binoculars to bird navigation.

A.G.

Hours and The Birds: a Saskatchewan Record by **R. D. Symons**. Pp. 215, generously illustrated with the author's own line-drawings and 17 colour plates. Toronto University Press; London: Oxford University Press. £5 19s. od.

I found this book entirely satisfying. It is by a man who has obviously retained a deep love for his mother country (evident from his frequent references to our birds, customs and literature) but at the same time has become thoroughly enchanted by the country of his adoption. The book is an account of the bird-life of Saskatchewan, an area whose topography, climate and history are outlined. The author then deals in greater detail with the various faunal zones and their typical birds. He does not follow the pattern of a guide or handbook, but his accounts of the groups of birds are more of personal observations and consequently of greater interest, and much more graphic. The pages of field sketches are unique and quite delightful. The artist comes through equally in the prose, to make this as vivid as his pictures. The tenor of the whole book is refreshing in this age when it is fashionable to treat birds too much as objects of scientific study only. Symons acknowledges an inspirational debt to Gilbert White. Here is a book in the same tradition as *The Natural History of Selborne* — I liked it immensely.

Besides a bibliographical appendix there is one containing advice for would-be bird-watchers, and another constitutes a check-list of the birds of Saskatchewan. It is very useful to have three separate indices for birds; for plants; and for mammals, fish and insects. And at the end of the final index we find once again another of those charming field-sketches.

R.F.D.

Spurn Bird Observatory Report for 1967.

Although this report was available by mid-September 1968, the editors apologise for its *late* appearance!

It follows the established pattern in the main, with the customary sections on spring and autumn migration and on wader migration. These are so packed with facts and figures that they do not always make for easy reading and it is a relief to come to one of the few tables. Personally I would prefer more use to be made of histograms, graphs and tables where possible.

As usual there is a full systematic list, a section on the status of breeding species and ringing, retrap and recovery lists. In addition, this present report carries a special feature on the autumn migration of seven selected passerines and a list of all species recorded at Spurn Bird Observatory.

In the section on breeding birds, the statement (without elaboration) that 42 singing Skylarks suggests a breeding population of ca. 45 pairs will cause some wonderment. Similarly it may be asked if the fact, on its own, of 33 singing Dunnocks would not suggest *fewer* pairs of birds, rather at least 40. One would suspect, too, that the statement that foxes took every (Little Tern) chick is not based entirely on direct observation.

The list of birds recorded at Spurn Bird Observatory will be puzzling to many for some of its inclusions and for the omission of other species. Clarification is needed when this list is next revised, to put its objectivity beyond doubt. Ruddy Shelduck is included but not Flamingo and Red-headed Bunting. One guesses that some species (e.g. Stilt Sandpiper and Buff-breasted Sandpiper) listed in Chislett (*Birds on the Spurn Peninsular*) have been omitted because of a more rigid definition of area. Since the present list is said to be based on Chislett's, a statement to this effect would remove any suspicion that there might be other reasons for omitting them. Is it the age of the record which excludes Houbara Bustard, Little Bittern, Glossy Ibis? Yet Blyth's Reed Warbler, Spotted Crake, Pallas's Sand Grouse and White-tailed eagle are in. Water Pipit is not included; Blue-headed Wagtail, Arctic Redpoll and Black-bellied Dipper are. Lesser Kestrel and Red Grouse are surprising species to have been recorded at Spurn, yet Black-necked Grebe appears not to have been seen. It would have been useful, as in Chislett's list, to have had years indicated for those species of only one or two occurrences.

In the recoveries section the species names do not stand out sufficiently, especially on p. 71.

In 'Autumn Migration of Small Passerines at Spurn', P. R. Evans repeatedly takes Spurn ringers to task for not ageing birds caught. I have often felt that those who do this confidently, may also often do it incorrectly and in the particular circumstances obtaining at Spurn it is often better not to require too great precision in this respect. I must confess to being puzzled about the object of the exercise of this paper and the discussion and conclusion seem in fact to reach no conclusion at all. To claim that three recovered Redstarts (ringed at Spurn) were of Continental origin, whilst Whitethroat and Willow Warbler were British migrants is quite unfounded. There is no basis for claiming that the majority of Spurn Wheatears originate further west. Big falls of this species often coincide with those of Redstart and Pied Flycatcher. Those who know Spurn well will realise that the totals of Whitethroats caught vary less from year to year than those for Redstart and Garden Warbler because a high proportion of the former are in fact local breeders. With too little to work on, this paper strikes me as premature.

All in all, the 1967 report maintains the standard of its three predecessors, attractively produced and full of meat. All who have visited Spurn and many others besides will wish to obtain copies. They are 3/6d. each, obtainable from the secretary of the Spurn Bird Observatory Committee, or from the Spurn Warden. R.F.D.

The Foxes of Beachy Cove by **Harold Horwood**. Pp. 190. Peter Davies, London, 1968. 25/-.

A North American idyll, set in Newfoundland, in which the author watches foxes in particular and wildlife in general. The actual observations on foxes and the speculation on the unseen sectors of their lives link together well, and the whole makes a very pleasant and readable book. To me, at least, this type of book can do a great deal towards arousing sympathy for wildlife in areas where, as yet, the full squeeze of civilization has yet to be felt. Not by any means to be regarded as a book on foxes exclusively. T.M.C.

Ornithological Report (1967) for Northumberland, Durham and the Farne Islands (published August 1968).

The reports for the three areas are published together in one volume of *Transactions of the Natural History Society of Northumberland, Durham and Newcastle upon Tyne* (Vol. XVI, no. 5). Available from The Hancock Museum, Newcastle upon Tyne, NE2 4PT, at 10/6.

The Durham section is edited by D. G. Bell; that for Northumberland by J. D. Parrack and for the Farnes by Grace Hickling, whilst a ringing summary is contributed by P. Yeoman. The report reflects the general increase in Golden Oriole sightings in 1967, and records breeding of Garganey, Goosander and Common Gull in Durham. Fulmars bred at three inland quarries in Northumberland whilst in late May two birds were seen circling Durham Cathedral tower, where Barn Owls apparently nested successfully. It is pleasing to learn that the breeding status of heron improved, but in contrast no Peregrines were proved to breed in either county. It was perhaps appropriate that one of the American waders (Lesser Yellowlegs) should have occurred in Co. Durham, at Washington. Others were Baird's and Pectoral Sandpipers. The first record this century in Durham for White-winged Black Tern is documented, and the first Greenish Warbler was recorded in 1967.

It will be of interest to Yorkshire ornithologists that as many as 10 breeding pairs of Stonechats are on the north-east coast of England. The Y.N.U. exchange copy of this attractive, well-printed and punctual report is held by H. O. Bunce, recorder for V.C. 61. R.F.D.

Studies in Invertebrate Behaviour by S. M. Evans. Pp. vii + 110, with 33 figures in the text. *Scholarship Series in Biology*, Heinemann, 1968, 16/-.

This is a splendid little book covering a wide range of behavioural studies. In an introduction and seven other chapters the author is concerned with courtship, feeding, location of hosts by parasites, movement, escape responses, social behaviour, and certain aspects of learning. As a member of a scholarship series should be, this is truly scholarly in content and presentation. The material is well chosen and the skills of a high level schoolmaster are patently obvious. The dilettante sixth-former will be able to dip into it to provide material for examination questions but the genuine student will also be able to obtain a wide grasp of the subject as a whole. The additional reading list of books and research papers is impressive.

Strongly recommended to sixth-formers and University students of all levels; although rather small, well worth its price. H.H.

The Dance Language and Orientation of Bees by Karl von Frisch. Translated by Leigh E. Chadwick. Pp. xiv + 566 with 454 figures and 45 tables. 1967. Harvard University Press; London: Oxford University Press. 110/-.

As early as 1788 Ernst Spitzner had described the dancing of the bees and had correctly interpreted it as a method of communication. As has not infrequently occurred, this early discovery was forgotten and the rediscovery was made independently by several people, one of them being Dr. Frisch. The intensive investigations of the roles of these dances in the economy of the hive, conducted by von Frisch and his co-workers over almost 50 years represent one of the most fascinating and rewarding episodes of 20th-century biology. The bare essentials of the discoveries, namely that a communication of precise information about the external world is involved and that this is unknown elsewhere in the whole animal kingdom apart from man, are now widely known. A bee finding a rich source of nectar or pollen near the hive stimulates others by means of the 'round' dance to go out and search in all directions within the area near the hive for the newly-discovered food supply. They are guided by olfactory clues — the fragrance of the flowers clinging to the dancer's body in the hive and the odour released from the scent organ of the dancers when they have returned to the flowers. A bee finding a rich but distant food source carries out on her return the 'tail wagging' dance on the vertical comb in the hive. Like the round dance, this announces the existence of the food supply, the kind of flower and the potential productivity of the supply. It also makes known the distance to the goal by means of the tempo of the dance and the compass direction of the goal by means of the direction of the straight portion of the run in the dance pattern.

In this book Professor von Frisch recounts with a wealth of illustration and in considerable detail the experiments conducted largely by himself and his many

co-workers and relates their findings to those of other workers. Since the elucidation of the 'language' of the bees inevitably involves the study of how they find their way about, the book is divided into two sections. The first, amounting to two-thirds of the book, deals with the dances themselves. After an initial chapter on methods of study, the round dance and the wagging dance are described and discussed in the greatest detail. Further chapters are then devoted to related topics. Racial differences in the language are specified and the possible phylogeny of the dance is discussed by reference to other *Apis* species, to the Meliponine bees and to some other insects. The dances are used for objectives other than the collection of nectar and pollen — to the collection of water when supplies in the hive are low, to the collection of propolis and to the selection of a suitable site for occupation by a swarm. Especially interesting and important are the accounts of the regulation of the activity of the foragers according to the food supply and the modification of the bees' activity in response to their own requirements. The second section of the book deals with the orientation of the bees, both on long-distance flights, where landmarks and the compass sense are of prime importance, and when near the goal when both vision and olfactory discrimination are involved.

As an authoritative summary of a wide field of investigation about bee behaviour, this book is important for the research worker. It is also a fascinating book for the general reader. Professor von Frisch recaptures the excitement of the long and arduous process of discovery, the false clues, the successes, the misinterpretations sometimes themselves leading to further advances, and finally the recognition, at the end of 50 years of painstaking work, of further and more subtle depths of ignorance. As he says on p. 230, although we may be pleased that we understand these dances so well, how clumsily do we interpret the information given by the bee. In order to interpret the dance we must have a distance curve and a circular diagram both pieced together from many single observations. We must have a stopwatch, the azimuth curve, a compass, a surveyor's tape and some assistants. But the bee need follow only a few dance circuits in the dark hive and then set out in free flight directly for the goal!

E.B.

East Yorkshire Field Studies edited by **J. W. Neale, Brenda E. Moon and L. H. Emery**. Pp. 34 with 3 figures. Obtainable from J. W. Neale, Dept. of Geology, The University, Hull. 4/6.

This joint publication of the Hull Geological Society, the Hull Scientific and Field Naturalists' Club and Field Studies Association (Hull and East Yorkshire) contains four papers. K. Fenton writes on the breeding birds of the Flamborough cliffs and L. H. Emery on the seaweed and animal communities of the rocky shore at Flamborough. Miss Crackles contributes an account of 'Some Plant Associations of the River Hull Valley'. This contains interesting information, based on old maps, which throws light on the probable history of the flora of the Leven Canal and the presence there of *Calamagrostis stricta* and which strongly supports her grounds for regarding this as a relict flora. Messrs. Witham and Boylan describe the famous middle and upper Jurassic strata of the South Cave area and their fossil fauna.

We wish every success to this well-printed and produced publication and hope that the financial support from East Riding naturalists which it thoroughly deserves will be adequate to ensure a succession of further issues.

Highland Year by **L. MacNally**. Pp. 117, with 83 black and white photographs. Phoenix House, London, 1968. 36/—.

At the south-eastern end of Loch Ness the author of this book lives, in close contact with a fair cross-section of the Scottish fauna. Deer especially are his neighbours and also his work, for he is a Head Stalker, and it is with these animals that his book reaches its highest point. Red, Roe and Sika are all covered in his observations and pictures which form a graphic coverage of their year under highland conditions.

Apart from deer, all the inhabitants of the hill are here too — Fox, Wild Cat and Golden Eagle, Grouse, Ptarmigan and Mountain Hare. Foxes particularly engage the author's attention, and his stories give them credit as wily adversaries of the deer conservator and keeper. There are also observations on Golden Eagles which obviously could not be made by anyone who was not abroad in their habitats at all times, in all weathers, and consequently these, like the rest of the author's observations, have about them the quality that has led to this book receiving high praise in many quarters. Just the book to read before that next Scottish holiday.

T.M.C.

British Shells by **Nora F. McMillan**. Pp. 190 with 32 colour plates and 48 plates of line drawings. Frederick Warne and Co. Ltd., 1968. 50/-.

The intention of the publishers was to produce a revised edition of Edward Step's *Shell Life* (1901), one of the many winners in their *Wayside and Woodland* series. Mrs. McMillan agreed to do this but, to use her own words, "It proved impossible to bring up to date the Victorian proximity of the original, and an entirely new book had to be written".

A devoted professional conchologist with long experience among museum shell-collections, the author is also an active member of the Yorkshire Conchological Society, well qualified to undertake the formidable task. The result is an attractive book of good value, generously illustrated and accurately printed, recommended to shell-collectors and those concerned with the identification of the British shell-bearing mollusca. Apart from a group of tiny *Pisids*, all the species living in the British Isles and shallow seas around them are described, covering nearly 600 marine and 180 freshwater or terrestrial forms, and of these no fewer than 355 are figured.

On the whole the colours of the sea-slugs and marine shells are nicely rendered and scales are included; but the plate of land-slugs is misleading — each animal being unrelated in size and lacking scale. Bridget Finlow is responsible for much of the black and white work, mostly satisfactory but lacking critical care among the smaller land species.

Drawings of British Plants: Part XXV: Plantaginaceae, Illecebraceae, Chenopodiaceae by **Stella Ross-Craig**. G. Bell & Sons Ltd. 13/6.

It is always a pleasure to greet the arrival of another part of Stella Ross-Craig's *Drawings of British Plants*. With the previous part she brought her total of species illustrated in this series to over 1,000. The present part contains 36 plates and the drawings have all the elegance and clarity of outline which invariably distinguish her work. Those of the Goosefoots are likely to be of particular value on account of the dissections and the details of seeds and surface markings of the testas, though a comparison of the testa details with Clapham, Tutin and Warburg's figure 36 shows what appear to be marked differences in four of the eight species depicted. The erect habit drawings of *Plantago coronopus* and *Atriplex laciniata* look unnatural and why has not the pronounced meanness of the leaves of the latter been indicated as with the Goosefoots? The *Salicornias* look deceptively easy to distinguish as here depicted; the drawings are beautiful, but five are enough of this distressing genus! On the other hand one regrets the exclusion of *Chenopodium glaucum* and *C. hybridum*. Surely they should have been given the benefit of the doubt as to status by being included. But these are minor criticisms; I have nothing but admiration for Miss Ross-Craig's drawings which are as aesthetically pleasing as they are scientifically accurate.

W.A.S.

British Mosses and Liverworts by **E. V. Watson**. Second edition: pp. xv + 489, with 18 photographic plates and 242 text figures. Cambridge University Press. £4.

Thirteen years have elapsed since the publication of the first edition of this book, which received an enthusiastic reception from bryologists. One slight criticism of the original work, especially from bryologists in the North of England, was the omission of a number of species which we were frequently coming across. This has now largely been redressed, and in this new edition over 60 species are now included for the first time, examples being *Dicranum strictum*, *Barbula cylindrica* and *Acrocladium stramineum*. The *Sphagna* receive more extended treatment, and revisions of the genus *Plagiothecium* and the bulbiferous species of *Pohlia* are most welcome. I had hoped that new light might be shed on *Philonotis caespitosa*, which our Mr. Branson has so persistently recorded of recent years; however, as the experts themselves are scarcely agreed as to the value and limits of this species, its omission is hardly surprising. Considerable re-arrangement has taken place among the liverworts and it is valuable to have a full description of *Riccia sorocarpa* along with *R. glauca*, the figures for the latter also having been re-drawn. The field key of the first edition has been omitted from the second as it had been found that bryologists were making little use of it. The new price of £4 may seem rather high, but as Y.N.U. members well know, printing costs have risen sharply of recent years.

Dr. Watson has performed a most valuable service to bryology by the publication of this new edition of his excellent work. To the practising bryologist it will be quite indispensable.

G.A.S.

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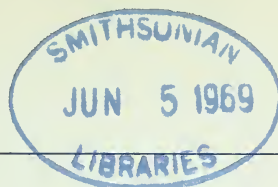
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THE YORKSHIRE NATURALISTS' UNION

ENTOMOLOGICAL SECTION

Field Meetings, 1969

No formal field meetings have been arranged for the coming season; instead it is hoped to organise more excursions than in the past, but at very short notice with particular attention being paid to weather and collecting prospects. Localities to be visited will be decided upon as the season progresses.

Will anyone (entomologist or non-entomologist), who would like to be kept informed please forward a stamped addressed envelope or, preferably a telephone number to: Mr. P. Skidmore, Museum and Art Gallery, Chequers Road, Doncaster.

Y.N.U. NEWSLETTER

The Y.N.U. Newsletter, sent to all Full members and Affiliated Societies, is published three times a year: February, May and November. Its aim is to provide a means of intercommunication between all members by giving, for example, reports on Y.N.U. and Society meetings and activities, items of broad Natural History interest, details of all types of surveys and enquiries. All items should be sent to the Newsletter Editor: Mr. H. T. James, 238 Sigston Road, Beverley, Yorks.

THE LEPIDOPTERA OF YORKSHIRE

Elsewhere in this issue will be found the fifth part of this paper. The final parts should appear later this year; at the end of the final part we hope to have space for the more important corrections and additions. In the introductory remarks to the first part, published in April 1967, we said: 'We shall welcome advice which will enable our records to be made more accurate.' Little or no such advice has been forthcoming. The editor would welcome notes drawing attention to errors or omissions so that these can be included in the final part.

It is intended to follow the main paper with a further paper in 1970 in which is given an analysis of the present list and a comparison with Porritt's List, drawing attention to the changes that have occurred since the turn of the century.

C. I. RUTHERFORD,
Longridge, Macclesfield Road,
Alderley Edge, Cheshire.

THE REDISCOVERY OF *OROBANCHE ALBA* IN WENSLEYDALE

J. D. LOVIS

Department of Botany, University of Leeds

THE DISTRIBUTION OF *OROBANCHE ALBA* IN THE BRITISH ISLES

The distribution in the British Isles of the Thyme Broomrape, *Orobanchе alba* Stephan ex Willdenow (*O. rubra* Smith), is very curious. The majority of its known localities are situated on the western seaboard, predominantly in Scotland and there especially in Skye, but also in Cornwall and, very discontinuously, around the Irish coast (17). The Yorkshire localities are the only inland stations in Britain, apart from a solitary 1897 record from Cawthorpe Woods, a reputedly unlikely habitat, in N. Lincolnshire (3). The logic of such a distribution is not obvious, but whatever factor limits the distribution of this parasite in Britain, it is clearly not the presence of its host.

PREVIOUS YORKSHIRE RECORDS

The Yorkshire localities fall into three groups. There is a single locality in Upper Teesdale, where it was recorded from whin-sill at Holwick by F. A. Lees (13). The date of this discovery is not known and no specimen has been traced. *Orobanchе alba* has apparently not been found at Holwick or elsewhere in this district by any other botanist. The other Yorkshire localities are all either from the limestones of Wensleydale, or from the Craven district. There are no records for the East Riding.

In Craven the plant has always been excessively rare, isolated spikes being recorded at considerable intervals, and on very few occasions overall. A valuable analysis of the West Yorkshire records has been provided by Sledge (22), so only the briefest summary need be given here. Thus there are records for the last century from Malham Tarn (1801) and from near Settle (1811, 1854). In this century it has been seen between Kettlewell and Coniston (1908), at Norber (1919), and most recently at Malham (1953).

I am indebted to Miss Margaret Hartley of Cartwright Hall for the information that there is in the Lees Herbarium a previously unknown specimen from an unrecorded locality: '*Orobanchе rubra* — On *Thymus* on limestone scars. Kingsdale above Ingletton, M.W. Yorks. 7th Aug. 1886. F. A. Lees.' It is remarkable that Lees never published this find. His own copy of *Flora of West Yorkshire* (also at Cartwright Hall, and again I am indebted to Miss Hartley) bears a pencilled annotation in his own hand: 'L. Kingsdale Scars, 7.8.88'. This latter date is more probably correct, since if the find was really made in 1886, it would surely have been included in the 1888 Flora (9).

The history of *Orobanchе alba* in Wensleydale is very different from that in Craven. *O. alba* was first found in Wensleydale by James Ward on 'The Shoal, Leyburn, upon limestone' (23, p. 290). A specimen collected by Ward on Leyburn 'Shoal' on 19th July 1835 is in the British Museum Herbarium (A. C. Jermy, pers. comm.). In the first edition (1863) of his North Yorkshire Flora (1) Baker writes that 'I saw this species in 1861 at Leyburn Shawl, where it had been met with previously by Messrs. Ward and Pulleine', but cannot add any other localities. However, in the course of the next twenty-five years, the plant was found in several other localities. Thus in 1888 Percival (15) writes 'On the Main Limestone Scar of Leyburn Shawl as far as Preston; and on the same series of rocks above Carperby, over 1200 ft.', and in the same year Lees (9) notes that 'it occurs . . . in North Yorkshire at a level rising from 750 ft. (about Leyburn) to 1600 ft. on Nappa Scars.' Thus it was possible for Baker in the second edition (2) of his Flora to write (p. 164) 'From Askrigg to Carperby the hills stand boldly out towards the stream. There is along their edge an almost continuous line of the scars of the Upper Limestone, on most of which *Orobanchе rubra* grows.' The introductory section of Baker's work in which this statement is made was issued however in Sept. 1888 and it is significant that in the same year John Percival writes (16) concerning *O. rubra* on Leyburn Shawl that 'it is now fast disappearing altogether'. The cause of this decline is not known, but there has been an almost complete dearth of records for *O. alba* in Wensleydale during the present century. Indeed, it seems that until the discovery which is the subject of this paper was made, R. W. Butcher, who found one specimen (or possibly two, but not more) on Leyburn Shawl on 12th August 1923 (*vide* R.W.B., in litt. ad W. A. Sledge, 11.8.68), may well have been the only living botanist to have seen this broomrape in the North Riding.

OROBANCHE ALBA ABOVE CARPERBY

The discovery in July of this year (1968) of a substantial population of *Orobanche alba* in Wensleydale above Carperby was therefore entirely unexpected. On the occasion of the initial find, on 28th July, it was established that the broomrape occurred along a stretch of ground some two or three hundred yards in length and rising (in approximate figures) from 1000 ft. to 1200 ft. at the eastern end. A more leisurely visit five days later (2.8.68) in the company of Dr. W. A. Sledge resulted in a count of forty spikes and there is little doubt that some spikes remained undetected. *O. alba* occurs along a line of grassy broken ground at the base of the limestone scar, but above the bare scree patches. This situation is occupied by an open community in which only a small number of species of flowering plants occur with significant frequency. Local dominance is shared by *Sesleria albicans*, *Festuca ovina*, *Thymus drucei* and *Helianthemum chamaecistus*. The only other associates of consequence are *Festuca rubra*, *Koeleria cristata*, *Poa pratensis*, *Galium sternerii*, *Linum catharticum*, *Campanula rotundifolia* and *Lotus corniculatus*. (Nomenclature according to (4)). The locality is almost certainly an unusually warm site. It is directly south-facing and owing to the gradient of the slope, a gentle curve of the strata and the protection afforded by the surrounding topography, it must gain full benefit from its exposure to the sun.

THE ORIGINAL DISCOVERY OF THE CARPERBY LOCALITY

Evidence recently adduced by Dr. Sledge and Miss Hartley makes it virtually certain that this precise locality was known to Lees and further indicates that the station was probably first discovered by John Percival in 1884. The programme issued for a Y.N.U. meeting in Upper Wensleydale in June 1884 (20) mentions several notable plants as being present in the vicinity, but does not include *Orobanche alba*. However, a revised version of this programme was subsequently produced, in which '*Orobanche rubra* (Scar above Carperby)' was included. This was issued in 1885 together with a reprint of another article by Lees (7) as a small privately printed booklet (8). Furthermore, a specimen exists in the Lees Herbarium at Cartwright Hall labelled in Lees' hand thus: '*Orobanche rubra*, Sm. On Thyme on the limestone, Scar top, Carperby 1200 ft. Alt. Wensleydale, N. Yorks August 22nd '84. F. A. Lees.' However, it seems clear that the discovery was first made by John Percival, then residing in Carperby (later Professor Percival of the Kent Agricultural College), who evidently collaborated closely with Lees (then living at Gayle near Hawes) at this time, and was responsible for several other floristic discoveries in Wensleydale in this same year (7, 8).^{*} The site is more precisely indicated in another article by Lees (10) of much later date (1908), where he refers to *Orobanche rubra* affecting 'one line of scar-slopes only, those between the Oxclose, above Carperby (by Locker's Tarn, . . .), and those above Preston to Leyburn's Shaw-hill "Shawl".'

VARIATION IN *OROBANCHE ALBA*

The *Orobanche alba* inflorescences seen above Carperby in 1968 showed considerable variation in both size and colour. Some small spikes carried only four or five flowers, whereas the largest spike seen bore nearly thirty flowers and stood about six inches high. The population showed a surprising range of variation in the degree of development of purplish colour in the inflorescence. The occurrence of very different colour forms within this species has long been recognized (18, 19), but the descriptions available of the colours found in British specimens are not very precise. It would be of considerable interest to know whether or not the Yorkshire plants differed from those found in the ecologically and geographically very distinct western maritime localities,

^{*} In his copy of the 1st Edition of Baker's North Yorkshire (1) Lees inserted under *Orobanche rubra* 'above Carperby J.C. 1200'. Miss Hartley has analysed Lees' annotations in this volume, and has informed me (*in litt.*, 14.1.69) that she is now sure that 'J.C.' refers to John Percival (of Carperby?). In one case, *Juniperus communis* ('Moor edge above Carperby, J.C.'), a reference to J.C. corresponds with a record published by Lees (7, 8) and attributed by him to Percival. In each one of three other cases (including *O. rubra*) where Lees has written 'J.C.', the particular record concerned was subsequently attributed by Baker (2) to Percival.

particularly since 'most British specimens have deep reddish fls (*O. rubra* Sm.) but the type common on the Continent, with much paler fls, is sometimes found' (4). The colour of all the Carperby specimens is very different from the illustrations provided by both Keble Martin (6) and McClintock and Fitter (14), and is much closer to my recollection of a population seen in the Braunwaldalp, Kanton Glarus, Switzerland, in 1966. Descriptions of the colour of Yorkshire specimens appear to be few. Lees (11, p. 797) wrote 'old ivory, with a rusty blend'. On the other hand, Wynne-Edwards described his Norber specimen as 'a fine deep red' (22), and Butcher (*loc. cit.*) writes of 'a very obvious red colour'.

It is clear that more precisely characterized descriptions of the colour forms of *Orobanche alba* are desirable and on the principle that there is no time like the present for making a start, the following description of the Carperby population has been prepared, on the basis of the R.H.S. Colour Chart (21). Since the colours in this chart are not given colour names, those of the stated equivalents in the earlier (24) Horticultural Colour Charts are given.

Stem: varying from pale Saffron Yellow (21.C) to pale Spinel Red (54.D), depending on the degree of development of suffusion with Chrysanthemum Crimson (185.A). *Corolla*: background colour pale/very pale Mimosa Yellow (8.C/D) veined by and suffused with Chrysanthemum Crimson to a varying degree. *Stigma*: just prior to opening of corolla, Chrysanthemum Crimson (185.A), deepening with age to Ruby Red (59.A).

TAXONOMIC DIFFERENCES BETWEEN *OROBANCHE ALBA* AND *O. MINOR*

Orobanche minor Smith, which is much the commonest British broomrape and decidedly catholic in its range of hosts, is nevertheless a distinctly rare plant in Yorkshire and is therefore likely to be unfamiliar to many Yorkshire botanists. This species is in cultivation in the Experimental Gardens of the Department of Botany in the University of Leeds and the opportunity has been taken to make a careful comparison between fresh material of this species and *O. alba*, since it became evident that the standard British Flora (4) was not very helpful for determination of *O. alba*. The key given for the genus fails to separate *O. alba* satisfactorily from *O. minor*. The character used, the point of insertion of the filaments above the corolla base, varies in the material studied from 1–2 mm. in *O. minor* and from 2–3 mm. in *O. alba*, but most often approximating to 2 mm. in both species. In any case, this is not a convenient character for use in the field when only a single spike is present, since it cannot be satisfactorily studied without removal of a flower. The characters italicized in the 'C.T. & W.' description of *O. alba* do not clearly distinguish it from *O. minor*, except by colour. The difference in the aspect of the stigma lobes (contiguous versus distant) is only readily appreciated when material of both species is available for comparative examination. Furthermore, the descriptions given of the curve of the corolla in the two species are particularly misleading. A reliable distinction does exist in the shape of the corolla tube, which in *O. alba* widens conspicuously all the way from the base, flaring widely at the mouth, in contrast to *O. minor* in which the corolla tube instead of expanding throughout is slightly *contracted* beyond the middle. A further evident distinction is that the flowers of *O. alba* are nearly always borne erect, not spreading as in *O. minor*. Both of these differences are clearly illustrated by Keble Martin (6). The colour distinction shown in corolla and stigma is very clear when the two species are seen together. The Chrysanthemum Crimson of *O. alba*, a purplish-crimson, is basically a red colour, but the purple of *O. minor* is a lilac-purple, or violaceous purple (close to shades of Amethyst Violet, e.g. 84.C), without any indication of a reddish hue.

INTERPRETATION OF THE 1968 DISCOVERY

The question arises whether or not the flowering this year of *Orobanche alba* above Carperby was an exceptional event. This can only be really satisfactorily answered by systematic observation of the colony in future seasons, but the very size of the population suggests its permanence. Some traces were found of old flowering spikes from a previous season. There has not been opportunity to make a comprehensive search of the old Wensleydale localities. A visit by Dr. Sledge and myself to Nappa Scars failed to produce any *Orobanche*, while Leyburn Shawl (the classic locality and the one from whence came the last previous record in Wensleydale for *O. alba*) is now a totally unsuitable place for the plant, presumably because of lack of grazing, although expansion of the neighbouring quarry may well have also been a significant factor in the disappearance of the broomrape. Indeed, a brief visit failed to result in

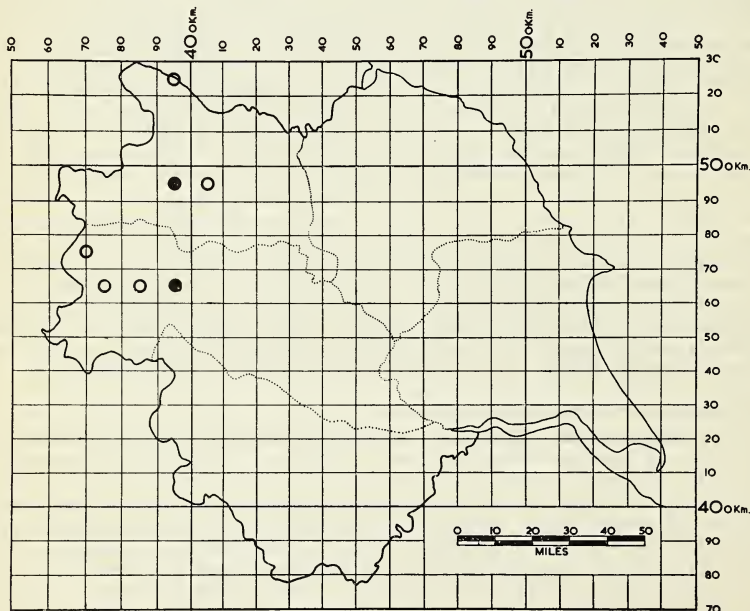
even a sight of the host species, let alone the broomrape. Subsequently, later in August, Dr. Sledge was able to examine parts of Preston and Redmire Scars but again without sign of the *Orobanché*. It is clear, therefore, that 1968 was not an *annus mirabilis* for *O. alba* in all of its old Wensleydale localities.

A basic difficulty in study of the distribution of species of *Orobanché* is that absence of inflorescences means that the plant cannot be found but it does not necessarily follow that the parasite is absent. We do not know how many seasons an *Orobanché* affecting a perennial plant can persist underground without flowering. The actual distribution of *O. alba* in Yorkshire may well be more widespread and less inconstant than its recorded flowerings suggest. It seems likely that the Yorkshire climate is marginal for the plant in that only rarely are conditions suitable for flowering. It has already been remarked that the Carperby station appears to be particularly well-favoured climatically and it may well be that this site is in consequence unusually favourable for flowering of *O. alba*.

The available indications thus suggest that *Orobanché alba* has persisted all along above Carperby and has escaped detection solely because the locality has not often been visited by botanists. It is perhaps significant that on the occasion of the discovery of this population, the possibility of encountering *O. alba* was entirely out of mind and in this sense the find was completely accidental.

It will be interesting to follow the development of the population in future seasons. I should be very glad to receive either directly or through the Editor of *The Naturalist*, spike counts and reports from the Carperby station, together with observations, negative or otherwise, from the other old Wensleydale localities. I would ask visitors to the locality not to remove spikes and to be careful not to damage the colony by trampling, otherwise not only may future observations on the population be prejudiced, but more importantly, the safety of the plant may be imperilled. (A voucher specimen has been prepared from the material taken for comparison with *O. minor* and has been deposited in the British Museum Herbarium).

Orobanché alba may well be perennial underground but for all anyone yet knows for certain, it might be monocarpic in habit in the marginally suitable conditions of Yorkshire, in which case seed-set would be vital to its continued existence. The proximity of old spikes to fresh inflorescences is not conclusive contrary evidence,



DISTRIBUTION OF *OROBANCHE ALBA* IN YORKSHIRE

since seed-fall will usually be most dense near the parent spike. Furthermore it is probable that the broomrape has considerable difficulty in successfully achieving seed production in the Carperby locality. Certain molluscs, which may be slugs or else the *Cepaea nemoralis* snails whose empty shells are very frequent on the site, must be very partial to the flowers of the *Orobanché*, for a high proportion of flowers had had their ovary eaten away.

Some may doubt the wisdom of publication of this record. Careful consideration indicated that only two rational alternative courses of action were open; either detailed publication or complete suppression, since publication of any worthwhile amount of accurate ecological information regarding the habitat must make the site readily identifiable by any competent naturalist. The author would like to join the Editors of the *Atlas* (17, p. xxiv) in their belief that 'For both rare and local species . . . education and information will serve the ends of conservation better than secrecy and ignorance.' Only time can show if this belief will be justified.

EXPLANATION OF 10 KM. SQUARE DISTRIBUTION MAP

The distribution of *Orobanché alba* in Yorkshire as shown in the *Atlas* (17) is incomplete. A revised map is therefore presented here. The allocation of several records to their correct 10 km. squares remains uncertain and in consequence an analysis of the records is given below for the guidance of future map-revisers.

Mid-West Yorks. V.C. 64

- 34/67 or 77 Kingsdale, 1886 (=1888), Herb Lees — this record could equally well belong to either of these two squares, there being about the same amount of likely ground in both.
- 34/76 Norber, 1919, 'above Dear Bought Wood . . . before you come to the first erratic boulders' Wynne-Edwards (*loc. cit.*).
- 34/86 Attermire, 1811 (25).
- 34/96 Malham, 1953 (22); Conistone Cold, s.d. (12); Awes Scar, 1801 (12) — Mr. Frankland has confirmed (*in litt. ad.* W. A. Sledge, 16.12.68) that his 1953 record belongs to this square, and not to 34/86 as indicated in the *Atlas*.
- 34/97 The reference by Sledge (22) to a record 'of a single plant growing on Scar ledges at Kettlewell, towards Conistone' is based on 'scar ledges of Crookacre towards Conistone, 1 spn. 1908' (11). It has been assumed here that this locality is identical with 'Scar lynchies over Conistone Cold' (12), which surely belongs to 34/96, but if these two records by Lees do not refer to the same station, then it is possible that the Crookacre plant was in fact found in 34/97. It all depends on how far south did Lees intend by 'towards'. (The record for 'scar lynchies over Conistone Cold' is supported by an insertion 'Conistone scars!' in a copy of the *London Catalogue* which was marked and annotated by Lees principally but not exclusively as a 'Grassington Florula', and is now in the possession of Dr. Sledge. This marked *Catalogue* is clearly the basic source of a list (in which *Orobanché rubra* is included, p. 25) of the flora 'of Grass Wood and the environs from Grassington to Conistone, . . .' compiled by Lees and published posthumously (10A)).

North-West Yorks. V.C. 65

- 34/99 Above Carperby, 1968; *ibid.*, 1884, Herb. Lees; Nappa Scars, s.d., (9).
- 35/92 Holwick, 'whin-sill exposures' (13) — this record could belong to 35/82 instead of this square.
- 44/09 Preston, s.d. (2); Leyburn Shawl, 1861 (1); *ibid.*, 1835, Herb. Ward (BM), etc.

ACKNOWLEDGEMENTS

I would like to record my warm gratitude to Miss M. M. Hartley, Mr. A. C. Jermy, Miss C. M. Rob, and Dr. W. A. Sledge for their invaluable help in tracing records and specimens of *Orobanché alba* and to Dr. Sledge again for his assistance in the field investigations.

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CHISLETT MEMORIAL LECTURE

The fourth Chislett Memorial Lecture was held in the University of Leeds Adult Education Centre, Middlesbrough, on Saturday, 8th March 1969, under the Chairmanship of Dr. Denis Summers-Smith.

Mr. Robert Spencer, Ringing Officer of the B.T.O. spoke on 'Progress and Prospects in Migration Research'. Much of our present knowledge has been gained by trapping and ringing which had made very large samples available for comparison. Careful weighing had shown that many birds gained considerable weight prior to migration and this fat enabled some birds to fly 50 hours without food or rest. It had recently been found that at least in some birds there was also an increase in muscle tissue. Radar studies by Dr. Lack and others had provided information concerning the volume of migration, particularly at night. It could also determine accurately the height at which birds migrated and the effect of weather. Most took place at heights below 5,000 ft. but some had been observed at heights up to 21,000 ft. Radar could not, however, determine species and Mr. Spencer expressed the opinion that Radar studies had passed the peak of their usefulness. The information provided by ringing was more precise. Mr. Spencer also described experiments with birds in a planetarium which showed that night flying migrants made use of the relative position of the stars. The lecture was illustrated by slides showing the information which had been gained from ringing such species as ring ouzel, lesser and common whitethroats and some of the ducks.

Dr. J. D. Pickup proposed a vote of thanks to Mr. Spencer which was carried with acclamation.

DOUGLAS WRIGHT.

THE BREEDING OF THE OYSTERCATCHER IN NORTH-WEST ENGLAND

M. E. GREENHALGH

The British population of the Oystercatcher (*Haematopus ostralegus*) has been described by Buxton (1961) and Dare (1966), the latter finding that it was in a phase of expansion in northern areas as a result of increasing protection and changing habits whilst in the south the breeding ranges were contracting into nature reserves and on islands, due to habitat destruction and disturbance.

Since 1963 I have made a study of this species in an area of north-west England including Lancashire, Westmorland and parts of W. Yorkshire and Cumberland. This has involved censuses of the breeding populations in the area and the collection of nest data. Some of the results from the Ribble Valley, which appears to be the most southerly river valley in England where breeding occurs regularly (Dare, 1965), have already been published (Greenhalgh, 1966).

BREEDING POPULATIONS

Complete censuses were made in 1967 and 1968 along the coast between the Ribble Estuary, Lancashire and the Kent Estuary, Westmorland. Several other coastal

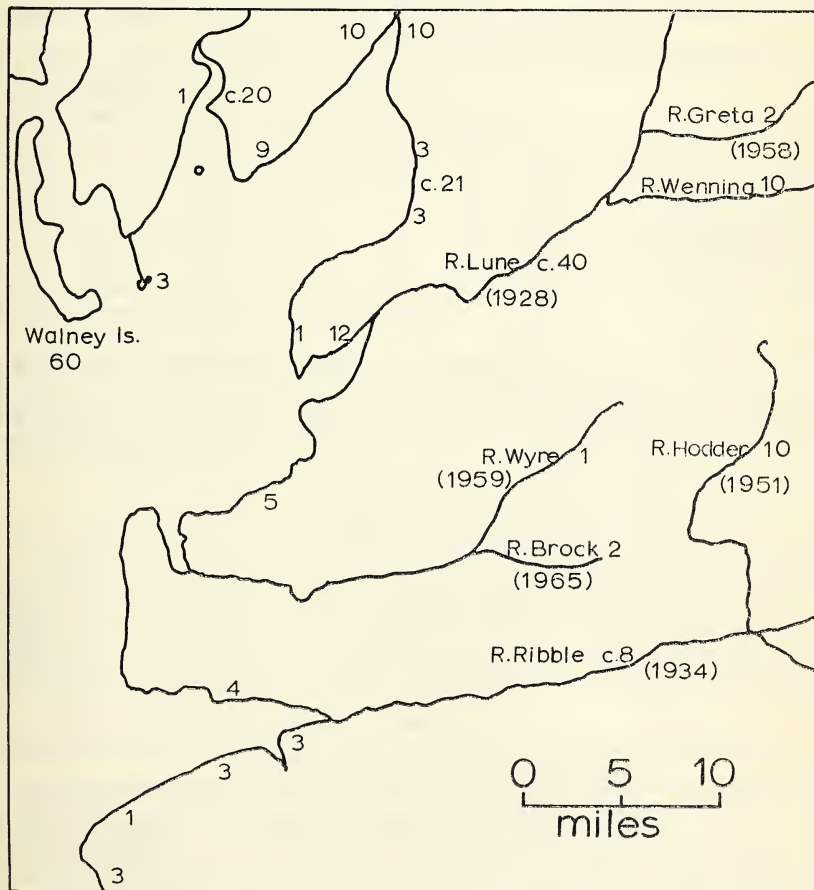


Fig. 1. Map showing the area of north-west England included in this study with the number of pairs of Oystercatchers marked. The year of first breeding on inland rivers is shown in parentheses.

sites in south-west Lancashire and the Furness District of Lancashire were also counted in at least one of the years since 1963. Complete censuses were made inland on the River Lune between Lancaster and Kirkby Lonsdale (1966-8) and the Ribble between Preston and the junction of the Ribble and Hodder (1963-8). Some stretches of these rivers were also counted in other years as were the Rivers Wyre, Brock, Hodder and some Lune tributaries. The results are summarised in Figure 1. Also is shown the date of first breeding on the rivers inland obtained from Buxton (1961) or personal observations.

The commonest coastal habitat in this area is saltmarsh and on some of the marshes high densities of Oystercatchers occur (Table 1). The Oystercatchers tend to nest on the outer edges of the marsh next to the high tide line, or by the sides of the wider channels which dissect the marshes. They seem to prefer areas of short, sparse grass, usually *Puccinellia maritima*, and may be attracted by the heavy grazing and deturfing which occurs on many marshes. They also nest on slag tips and railway embankments across the saltings in Morecambe Bay (Dare, 1966 and personal observations) probably as this affords protection from exceptionally high tides or perhaps because they like the bare stony surface to nest on.

TABLE 1

The Oystercatcher populations of saltmarshes between the Lune Estuary, Lancashire and the Kent Estuary, Westmorland in 1967-8.

	No. of pairs		Density (pairs/100 acres)
	1967	1968	
Colloway Marsh	13	12	2.3
Middleton Marsh	3	1	0.9-2.7
Hest Bank Marsh	6	5	1.2
Carnforth Marsh	20	21	2.5
Silverdale Marsh	3	4	0.9
Arnside Marsh	10	11	11.1
TOTAL	55	54	2.8

Elsewhere in the area coastal breeding habitats include the sand dunes of south Lancashire where only about five pairs nested in 1967 and four pairs in 1968 (they have been decreasing there due to disturbance), Walney Island where 50-60 pairs nest and along the open shore where there is little disturbance (for example, on parts of the Cumberland coast where I counted twelve pairs along two miles of beach in 1967). Smaller numbers breed on coastal arable fields.

The most typical inland Oystercatcher habitat is by the side of rivers. On the Ribble I have found a density of one pair for every two to four miles of river (Greenhalgh, 1966) and further observations since then have shown little change. On the Lune numbers appear to be increasing as can be seen by comparing the data of Dare and my own counts for 1966-8 (Table 2) and the summary of Buxton (1961). However, distribution is not even, there being high concentrations in some areas whilst only single pairs nest on other stretches of river. Stretches with highest Oystercatcher concentrations have generally large areas of shingle bank or island with little disturbance.

TABLE 2

The Oystercatcher population of the Lune Valley between Lancaster and Kirkby Lonsdale (14 miles) in four censuses.

	Number of pairs	Density (pairs/mile)	Source of data
1963	38	2.71	P. J. Dare
1966	40	2.85	This study
1967	47-51	3.35-3.63	—
1968	52-54	3.72-3.85	—

Most inland breeding Oystercatchers nest within a hundred yards of the river although this is not always the case. Odd pairs have attempted to nest as far as four miles from the Lune in meadows and pasture and by reservoirs in the Lune and Wyre valleys. These few pairs usually have little success.

BREEDING BIOLOGY

Breeding pairs appear in the coastal areas from late February or early March. It is often difficult to know when they pair due to the large wintering population which occurs in north-west England, with which the breeding population mixes. On the Inner Ribble Marshes, where there is no large winter population, some do not arrive already paired and pair formation takes place there.

The inland breeders, which are absent from the breeding areas throughout the winter, return at a similar time. Some return already paired but many do not, forming in pre-breeding assemblies of up to 150 in the breeding areas. It is not known how many of these pre-breeding assembly birds remain to breed in the area; some may be passage migrants which cross northern England in spring (Spencer & Greenhalgh, 1965). By mid-April pairing has taken place in the river valleys.

THE EGG STAGE

The nest site appears to be chosen and the scrape made up to two weeks before the eggs are laid and a great deal of time is spent, when the pair is not displaying or feeding, in the area of the nest-site.

The nest is simply a scrape in the ground made by the bird scratching with its bill and feet, and smoothed and shaped with the body. To this scrape may be added a lining of dry grass stems or small pebbles. Also I have found Rabbit droppings, cinders, feathers, and the flower heads of *Armeria maritima* and *Cochlearia officinalis* and the shells of Cockles (*Cardium edule*) lining the nest.

The first eggs are laid from the end of April or early May with a peak in the second half of May. My sample is too small for a comparison between the laying dates of the inland and coastal breeders. Laying of the first clutches continues to early June and replacements may be laid up to mid-June. I can find no significant difference in clutch size between the early and late nests.

The maximum number of eggs in a clutch has been four in this study though clutches of up to six have been found in north-west England (Robinson, 1935). Details of all clutches found in the study are shown in Table 3 together with those of Brown (1948) from the Cumberland Solway saltmarshes. There is no significant difference between the mean clutch sizes from the Solway and the inland and coastal areas of this study.

TABLE 3
Clutch sizes of Oystercatchers in north-west England.

	C/1	C/2	C/3	C/4	Mean
Inland	1	10	21	2	2.7
Coast	4	20	53	11	2.85
Solway	20	60	81	4	2.4

The data from the Solway Marshes are from Brown (1948).

The eggs are incubated for 25–27 days. In two accurately timed cases the hatching period was 45 hours and 37 hours at two different nests. Brief visits were made to these nests and the parents were kept away for no more than ten minutes so that the eggs and chicks were not chilled. During the incubation period many clutches and part-clutches are lost. The main single cause is flooding, either when a river is in spate or during periods of high spring tides, with human interference second. Whereas flooding may occur at any time throughout the incubation period, predation occurs mainly before the clutch is completed and incubation started. The figure for egg losses and hatching success in north-west England are given in Table 4.

TABLE 4

Hatching success and egg loss of Oystercatchers in north-west England, 1963-8.

Number of nests	Number of eggs	Number hatched	% eggs laid hatched
89	257	173	67%
The reasons for the loss of 84 eggs were:			
	Disappeared, predated or stolen by humans		39
	Flooding		27
	Destroyed by agricultural operations		9
	Destroyed by sheep		4
	Eggs cracked		2
	No egg development		1
	Dead embryo in shell		1
	Chick died during hatching		1

Some eggs were seen to be taken by predators and 17 were definitely stolen by humans. Those which disappeared however, were probably taken by predators (gulls, crows, rats, foxes, etc.) or humans and therefore I have grouped the three together.

A remarkable cause for egg loss on saltmarshes was discovered in 1967. Several times I had found nests with eggs lying outside them. In every case the saltmarsh was grazed by sheep. In 1967 K. E. Hague visited Colloway Marsh and checked a nest which was surrounded by sheep with one egg rolled outside. All the eggs were wet and sticky with the saliva of sheep. Later I kept watch for sheep near Oystercatcher nests and twice found a similar thing. The sheep lick the eggs and one may be rolled out of the nest.

SURVIVAL OF YOUNG AND BREEDING SUCCESS

It is very difficult in many of the areas to count how many young a pair of Oystercatchers is raising and to make close observations on them. When disturbed the young either 'freeze' or run to cover and in both cases it is difficult to find them. However, with intensive watching close observations are often possible.

After hatching, the young may remain in the vicinity of the nest for up to two days during which time they may be brooded by the adults. They are then led from the nest. Those nesting on saltmarshes lead their young to the marsh edge or muddy channels where they are fed. Those nesting behind the shore in sand dunes or on fields may either lead their young to adjacent saltmarshes or the shore; or, if vegetation is very thick, leave them in the vicinity of the nest and bring food to them there. Inland nesting Oystercatchers take their young to the riverside or keep them in the neighbourhood of the nest until they are fledged.

The first indications that there are young present is the behaviour of the adults. When the young are approached the parents utter the piping distress call and fly round the observer. In some cases one of the birds may carry out some form of injury-feigning, shuffling along the ground with wings held half-open, trailing, and depressing the tail, showing the white rump. During this time it calls incessantly and when approached flies off.

Sometimes when the young are approached one of the birds will fly or run up to 50 yards from the nest and 'false brood' in a similar manner to when it has eggs in the nest. Some birds have done this even when their young have been almost fully fledged. If the young are caught for ringing or weighing the adult approach boldly, on one occasion to four yards, and when the young are released they usually run straight to their calling parents who escort them away.

Of the 51 nests in 1967-8 for which I have full data with definite evidence of the number of young fledged, 84 young hatched from 144 eggs, and 58 (40%) fledged, giving an average of 1.1 chicks per brood (Table 5). Nests with C/3 appeared to have higher hatching and fledging success than C/2, though the number of C/2 was too small for this to be significant. Other estimates of chick fledging success vary greatly: in Finland, Nordberg (1950) recorded a 78% success whilst Grosskopf (1964) recorded a 5% success in Germany. Recently Harris (1967) published estimates of chick fledging success from Skokholm of 37% (in 1963) and 59% (in 1964), an average production of 0.9 and 1.5 young per pair for those years respectively.

TABLE 5
Breeding success of 51 pairs of Oystercatchers in north-west England.

	No. nests	No. eggs	No. eggs hatched	% hatched	No. young fledged	% eggs giving fledged young
C/2	11	22	12	54	7	32
C/3	38	114	72	63	51	45
C/4	2	8	0	0	0	0
TOTAL	51	144	84	58.3	58	40

These data were obtained in the 1967-8 seasons when I tried to obtain as much fledging data as possible. Thus the hatching success is lower than that given in Table 4 due to the high percentage flooded by high tides and rivers in spate in 1967.

Many chicks disappear in the fledging period, presumably some having been killed off by bad weather. Some very small chicks may be drowned. Predators, mainly gulls and crows, take many chicks. One young was found dead in the middle of a Common Tern (*Sterna hirundo*) colony and from its injuries it seems probable that it had been killed by a tern.

The fledging period is 28-33 days. After this time the young remain with the adults in the breeding area, leaving inland sites from the end of July to September. Those on the coast join the increasing flocks of passage Oystercatchers or move away from the breeding areas.

ACKNOWLEDGEMENTS

I would like to thank especially Dr. P. J. Dare for help and guidance through my study of the Oystercatcher and Dr. D. W. Snow for helpful criticism of this paper. My thanks also go to those who have given me help in finding nests and discussion, especially K. E. Hague and J. Wilson.

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ISOPOD SURVEY SCHEME: RECORDERS ARE NEEDED

This scheme is intended, in the first instance, to give detailed information about the distribution and habitat preferences of terrestrial isopods (woodlice), and less detailed information about freshwater and marine species. Distribution maps will be produced in association with the Biological Records Centre of the Nature Conservancy at Monks Wood and the ecological information analysed and written up when sufficient data have accumulated.

A great deal of information is needed and it is hoped that many people will send in specimens and records, whether or not they have had previous experience of this neglected group of animals.

Further details and recording cards can be obtained from R. J. A. Metcalfe, Trinity and All Saints Colleges, Horsforth, Leeds, LS18 5HD.

R. J. A. METCALFE, P. T. HARDING, S. L. SUTTON.

FIELD NOTES

***Lygus wagneri* Remane (Hemiptera-Heteroptera) in Yorkshire**

Species of the *Lygus pratensis* complex are attractive capsid bugs approximately 5–6 mm. in length. This difficult genus was reviewed by G. E. Woodroffe in 1966 ('The *Lygus pratensis* complex (Hem., Miridae) in Britain', *Entomologist*, **99** : 201–206). The occurrence of *L. pratensis* L. in Yorkshire, at Strensall Common, is commented upon by J. H. Flint in Yorkshire Naturalists' Union Annual Report for 1966 (*Nat.*, 1967, 17). There Flint states, "The older records of *L. pratensis* refer to the complex of species, now split up, of which *L. rugulipennis* Popp. is the most abundant and widespread and the only representative of the genus reliably known from Yorkshire before *L. pratensis* is evidently of very local distribution in the County".

Good numbers of a species closely resembling *L. pratensis* were found at Deep Gill near Hawnby on the occasion of the Union's visit on 16th June 1968, and these are referred to in the notes on entomology which I contributed to the report of the excursion (*Nat.*, 1968, 123). The specimens were subsequently sent to Mr. Woodroffe who kindly examined them and informs me that they are all *Lygus wagneri* Remane, a species first described in 1955 and not recorded before in Yorkshire. In his paper Woodroffe describes the distribution of *L. wagneri* as follows, "Open habitats — edges of arable fields, hedgesides, flowery banks, etc., as well as woodland rides in west and north, on various herbs, widely distributed and common; confined to forest rides in south-east, very local". No doubt future study will reveal this member of the complex to be more widely distributed in Yorkshire than the present single record suggests.

ROY CROSSLEY

The parasitic copepod *Lernaea cyprinacea* L. in Yorkshire

The presence of the parasitic copepod *L. cyprinacea* in Britain, almost certainly as a recent import with cyprinid fishes brought from continental Europe, has recently been made known (Fryer, G., *J. Nat. Hist.* (1968) **2** : 531–3). In addition to reports whose authenticity I was unable to check, five cases have been recorded since 1966. Of these, four occurred in a relatively circumscribed area in south-east England, and the other, in south-west Wales, involved fishes which had been brought from Hertfordshire just before the parasite was found. Mr. A. Rennie has now sent me an egg-bearing female of *L. cyprinacea* found in July 1968 by Mr. I. Lambert on a goldfish (*Carassius auratus* (L.)) purchased in Pontefract, Yorkshire, and also several specimens from goldfish bought in Bradford. The purveyor of the Pontefract fish claimed to have forgotten its provenance but the Bradford fishes had been imported from Italy. The parasite has now been found sufficiently often to suggest that it may be established in Britain, at least in aquarium and ornamental pond conditions. Its range elsewhere suggests that, given the opportunity, it will be capable of tolerating natural conditions in this country where, as it is one of the most virulent of freshwater parasitic copepods, its presence can be regarded as undesirable. Illustrations which enable *L. cyprinacea* to be recognised are given in the paper quoted above. Information on any further records of this species, which is referred to in aquarium literature by the name 'anchor worm', will be welcome.

GEOFFREY FRYER

**A Method of Vegetative Propagation in the Bryophyte
Philonotis capillaris Lindb**

In July 1964, I collected a specimen of the moss *Philonotis capillaris* from a shaded crevice near Snowdon Waterfall. This material appeared to be somewhat unusual in possessing numerous small very easily detached branchlets. Subsequently I suggested (in *Trans. Br. Bryol. Soc.* **4**, 5: 828 (1965)) that these branchlets could be propagula. In order to test this theory, I placed a number of the detached branchlets on cotton wool soaked in filtered soil water and enclosed in petri dishes. These were kept in daylight, but out of direct sunlight, during the period from 9th December, 1968 until 17th January, 1969. When the branchlets were examined on the latter date, it was found that new shoots and lengthy rhizoids had made their appearance from some of them. From the 17th January 1969 to 17th February 1969, the specimens have been examined at intervals and further growth and development has been observed which has involved more of the branchlets.

These observations therefore indicate the possibility of occasional natural vegetative dispersal of *Philonotis capillaris* by means of branchlet propagula.

This work was carried out at Nuneaton Technical College, Warwickshire.

J. H. FIELD.

THE PARASITIC COPEPOD *ERGASILUS SIEBOLDI* NORDMANN, NEW TO BRITAIN

GEOFFREY FRYER

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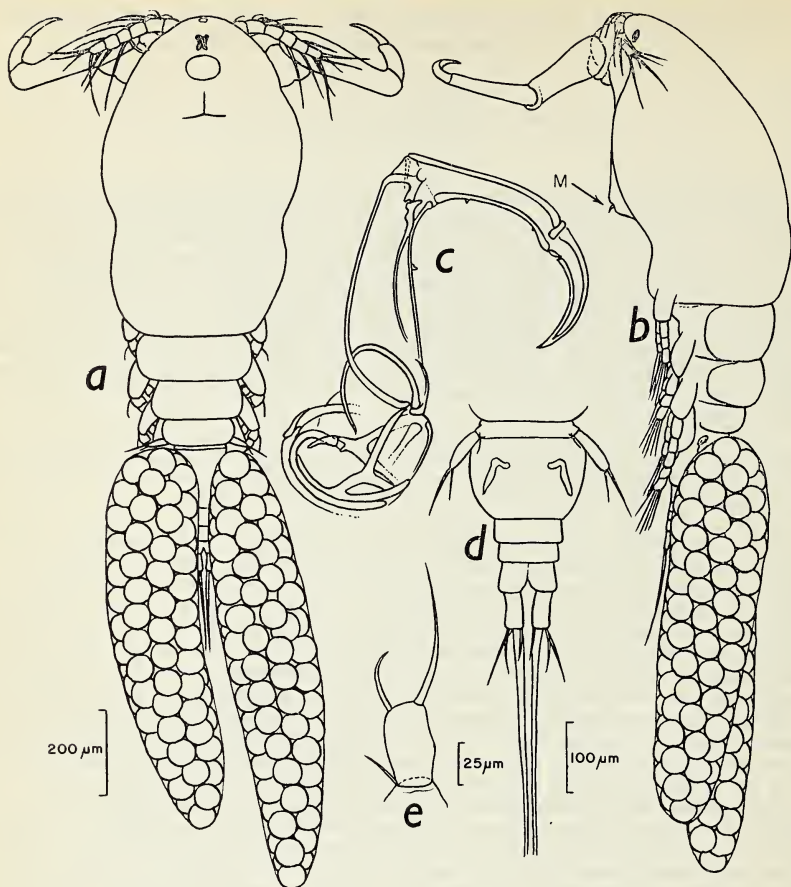
Although not hitherto recorded in Britain, the parasitic copepod *Ergasilus sieboldi* is common on many species of freshwater fishes in continental Europe. Because of this, and because he thought that it may either occur in this country and have escaped detection or be introduced in the future, Gurney (1933) included a description of it in his monograph of the British freshwater Copepoda. More than thirty years later Gurney's expectation was fulfilled when, in July 1967, Mr. R. G. Templeton of the Yorkshire Ouse and Hull River Authority found 12 dead Trout, *Salmo trutta* L., in the Howbrook Reservoir (Nat. Grid Ref. MR 330976) which lies between Sheffield and Barnsley, Yorkshire, and is in the Don drainage area. The gills of these were infested with parasitic copepods which he sent to me for examination and which proved to be *E. sieboldi*.

As Gurney's monograph — in which the illustration of *E. sieboldi* is borrowed from Markewitsch (1931) — is not readily available, and as British naturalists and anglers are seldom familiar with these parasites, the following notes and illustrations are presented in order to give some idea of the form and habits of this species. In essentials *E. sieboldi*, females of which are usually about 1 to 2 mm. in length, resembles a cyclopoid copepod in which the antennae (Fig. 1, a-c) have been modified for embracing the gill filaments of its host, to which organs it is confined, and in which the mouthparts have become specialised for the laceration of the gill tissues. When the parasite grasps the gill filament, to which its ventral surface is opposed, the mouth is brought against the host epithelium. The mandibles can sometimes be detected in individuals viewed laterally (Fig. 1 b, M). It is only recently that accurate information on its feeding habits has been obtained (Einszporn 1965) and, because of the difficulty of observing living animals *in situ*, the mechanism of food collection is still incompletely understood. Always the parasite is attached with its head directed towards the base of the gill filament, and it is only females which so attach themselves. These produce *Cyclops*-like egg sacs. The males are free-swimming, survive as adults for a much shorter period of time than the females, and are therefore much less frequently seen. They naturally lack the adaptations for a parasitic way of life shown by the females. Larval development is basically similar to that of cyclopoid copepods.

The only point of anatomy that calls for comment concerns the fifth pair of legs. These, which are shown in Fig. 1, d and e, are generally described as being composed of one segment. This, however, is arguable for close inspection shows that they in fact arise, not directly from the fifth somite, but from a minute pedicel which should perhaps be regarded as representing a much reduced basal segment. Such is the case also in certain non-European species of the genus. The apparent shape of the fifth leg differs, according to the angle at which it happens to be lying, as can be seen by comparing the right and left legs in Fig. 1, d, and particularly by comparing the shape as it appears in this view with that revealed when, as in Fig. 1, e, the limb is seen in face view.

Markewitsch (1931), who described the anatomy of *E. sieboldi* in considerable detail refers to and figures two terminal setae and a basal seta. Gurney (1933), who paid meticulous attention to detail and who is renowned for the supreme accuracy of his illustrations, shows only two terminal setae. His meticulous nature is shown by the fact that, although he used Markewitsch's illustration of the whole animal, on which leg 5 appears as a minute structure, he nevertheless removed the basal seta, being presumably convinced that it did not exist. Examination of the present material at first suggested that Gurney was correct, but very careful examination with an oil immersion lens usually succeeded in revealing the basal seta, and in individuals whose leg is suitably orientated the seta is in fact clearly apparent (Fig. 1, e). It is, however, delicate and cannot always be found, though this may be the result of inevitable rough handling during dissection. This seta arises from the minute basal pedicel.

Infestations of *E. sieboldi* are sometimes heavy. Schäperclaus (1954) mentions a Tench, *Tinca tinca* (L.), 36 cm. in length, with about 3,100 individuals on its gills, and Gurney cites Neuhaus who found 3,000 specimens on a Tench only 25 cm. in



Ergasilus sieboldi. *a*. Adult female, dorsal. *b*. The same, lateral. (The right antenna, which can be brought into focus by deep focussing, is omitted for clarity.) *c*. Antenna. Note the complex chitinous skeleton basally which serves for the insertion of an equally complex muscular system and also permits articulation of the segments involved. Note also the minute protuberances on the penultimate and ante-penultimate segments which enhance the efficiency of the grasping appendage. *d*. Posterior region of the body, ventral, to show the fifth pair of legs, the genital somite, abdomen and furcal rami. *e*. Leg, 5, face view.

Legend: M = Mandible.

length. As a result of the destruction of the gill tissues, withdrawal of blood, particularly leucocytes which have migrated to the seat of damage (Einszporn 1965), and the frequent bacterial and fungal infection of the wounds inflicted, less heavy infestations that this can lead to the death of the host. This parasite is therefore a highly undesirable inhabitant of fish ponds or other heavily stocked waters where the chances of re-infection are particularly high. Non-fatal infestations also influence the condition of the host, and Schäperclaus (1954) shows how the condition factor of the Tench is inversely related to the number of *E. sieboldi* carried.

Only detached gills from one of the infected Trout from Howbrook Reservoir were available. This specimen, 6.5 inches (*c* 16.5 cm.) in length, carried over 130 parasites on six incomplete sets of gill filaments. As numerous additional specimens had been detached, the total infestation was probably as high as 200 parasites — which is a considerable number for such a small fish. Sometimes two parasites were present on a single gill filament.

The infected Howbrook fishes were apparently part of a batch of Brown Trout which had been introduced to the reservoir about six weeks previously, when they were presumably free from infection. If this be so, then the infestation must have built up quickly, which suggests a large population of parasites in the reservoir. The period of maximum reproduction is usually during the warmest part of the year — which is when the fishes were introduced. As yet no information is available to show that other species of fishes in the reservoir are infected, though this is presumably the case.

I am grateful to Mr. R. G. Templeton, the discoverer of *E. sieboldi* in Britain, for providing me with material through the good offices of Messrs. I. Lambert and J. Robinson.

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A MIGRATION OF SYRPHID FLIES AT SPURN

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Reports of Syrphid migration appear in the entomological press from time to time, but as yet insufficient information is available to establish any migratory pattern in the British Isles or to provide answers to questions about methods of navigation and orientation. The following account of a well-defined southerly movement at Spurn Point, Yorkshire, between 20–22nd August 1968 is given in the hope of stimulating local interest and study in these much-neglected problems of insect migration.

I was informed of the migration by the Warden of Spurn Bird Observatory and was able to spend the whole of the 22nd investigating, in warm and sunny weather. The movement was characterised by abnormal numbers of Syrphids in the area and by visible migration southwards along the peninsula. To determine numbers of species and individuals in the Warren area, random sweeps over flowers were made with a net, and this was supplemented by a collection made the day before by the ornithologists. To estimate the numbers migrating I sat at the Narrows half way down the peninsula where the high tide marks are barely 35 yards apart, and here I made a half-hour count of the number passing overhead. A number of the migrants were caught and checks were made throughout the day to establish the duration of the movement. To determine the flight-path, observations were made at intervals along the peninsula and at the Point.

Since one sweep of the net over flowers could produce several hundred Syrphids, this line of enquiry produced an embarrassing amount of material. No attempt was made to hunt down unusual species and probably the variety present was far greater than that shown in Table 1, which lists the species taken by sweeping. It was estimated that on the ragwort blossom there was about one Syrphid on each floret, and that on a medium-sized ragwort plant there were approximately 200–300 of these flies. All the Syrphids are common species in northern Britain and have occurred before at Spurn. The absence of *Volucella* species was rather surprising.

TABLE 1
Syrphids taken by sweeping flowers at the Warren, Spurn, on 22.8.68.

Species	Number caught	Species	Number caught
<i>Syrphus balteatus</i>	21	<i>Eristalis tenax</i>	3
<i>Scaeva pyrastris</i>	11	<i>Melanostoma mellinum</i>	2
<i>Sphaerophoria scripta</i>	7	<i>Syrphus ribesii</i>	2
<i>Eristalis arbustorum</i>	6	<i>Helophilus pendulus</i>	2
<i>Syrphus latifasciatus</i>	5	<i>Syritta pipiens</i>	2
<i>Platychirus clypeatus</i>	4	<i>Syrphus vitripennis</i>	1
<i>Syrphus luniger</i>	4	<i>S. corollae</i>	1
<i>Melanostoma scalare</i>	3		

TABLE 2
Syrphids caught in the flight-path at the Narrows, Spurn, on 22.8.68.

<i>Melanostoma mellinum</i>	<i>S. luniger</i>
<i>Sphaerophoria scripta</i>	<i>S. balteatus</i>
<i>Scaeva pyrastris</i>	<i>Eristalis tenax</i>
<i>Syrphus ribesii</i>	<i>Helophilus pendulus</i>

Table 2 gives a list of species observed migrating at the Narrows, where they were found in approximately the same order of abundance as that shown in Table 1. Certainly *Syrphus balteatus* and *Scaeva pyrastris* dominated the flight. Some of the smaller Syrphids were probably missed. The sawflies *Selandria serva* (F.) and *Tenthredo acerrima* Benson were also taken and small numbers of bumble bees and Pierid butterflies appeared to be on the move. The involvement of small numbers of bumble bees in the migrations of other insects has been noted before (Rothschild, 1956). Flight at the Narrows was rapid and sustained, but numbers stopped and settled around me as I sat in the flight-path. The wind was southerly or south-easterly at this point, Force 3, and the flies were moving just in the lee of the dunes along the Humber shore in a column no more than 3 to 4 yards wide. The movement was not visible from the road, but was very apparent when viewed from a sitting position below the bank, where I was able to estimate the numbers passing me, silhouetted against the sky. Between 1130 hours and noon I calculated the rate of passage as between 100 and 200 a minute over a six foot front to one side of me as I sat facing into the flight, and as I was sitting in the middle of the flight-path the total number was probably double this. Movement continued at this rate through the early afternoon, but had slackened considerably by 1600 hours. The day before, by all accounts, the flight had been much more substantial with 'plagues of wasps' at the Warren and obvious movement along the road at the Narrows (however this latter feature was due, at least in part, to the lack of wind that day, which allowed the Syrphids to fly higher, along the road surface, where they were more noticeable).

Although basically a southerly movement along the peninsula, it was clear that the Syrphids were influenced by topography and were in fact coasting down the sheltered side of the dunes, this involving a substantial change of heading from south-east at the Warren, to south-west at the Narrows and then back to south-east at the Lifeboat station. On the southernmost tip of Spurn I noted individuals setting off on a broad front south and south-east into the wind. These made slow progress, flying low over the water, as is their custom in a strong head wind. Mortality was probably high, although no bodies were noted on the water line. Mortality on land was considerable, with dead Syrphids strewn along the flight-path and drifted into little heaps by the wind.

DISCUSSION

The migration outlined above is a carbon copy of one which occurred at Spurn in 1955 (Owen, 1956) involving the same species and agreeing even in such details as the presence of ab. *unicolor* of *Scaeva pyrastris*. The only major difference was that the wind was then westerly rather than southerly and the flight-path was along the North Sea shore (i.e. again in the lee). Passage at the Narrows was estimated at 500 per minute across a six foot front. Once more large numbers of dead bodies were found in the

flight-path. This report also mentions southerly movements of Syrphids at Spurn in previous years, notably in 1949 and 1950 and it may well be that a southerly movement in the autumn is an annual event, but one that is only recorded when migrants and entomologists encounter one another.

The narrow and well-defined flight-path following the curve of the dunes from the Warren to the Point clearly indicates that the flies at this stage were strongly influenced in their flight direction by topography. However, the fact that on reaching the southernmost tip of Spurn they set off across the sea with no landmarks in view (the Lincoln coast was obscured by haze) shows that topography had ceased to be the dominant influence and that another navigational aid was used thereafter. The most likely aids would be the sun's position or wind direction, and in connection with the latter it may be significant that the animals set off head into the wind. It may be noted that some insects (e.g. locusts) are known to orientate into the wind when flying under experimental conditions, but for active migrants such as Dragonflies, the larger Lepidoptera and Syrphids, field observations suggest that movements can take place irrespective of wind conditions, providing it is not so strong as to inhibit flight altogether. (It is interesting to note that Pierid butterflies were moving south in small numbers at the Narrows, but being rather weak fliers, were unable to progress against the head wind at the Point and steadily accumulated during the day in the Point area.) Orientation to the sun has often been suspected as the major element in the navigation of migrating insects, but many people have found it difficult to accept that an insect has a 'clock' with which to compensate for the movement of the sun in order to maintain a constant compass heading. A clock mechanism has been shown to occur in bees (von Frisch, 1967) but recently Baker (1968) had put forward evidence that Pierid Butterflies possess no clock and simply fly at a fixed angle to the sun, so that their compass flight direction changes during the day. This crude but simple method of navigation gives rise to a flight-path consisting of a series of daily arcs as the insect changes heading with the changing azimuth angle* of the sun. However, the effect is minimised in these butterflies by limitation of the flight period to the middle of the day. It may well be that Syrphids can navigate in the same way. It would be particularly valuable to know if the flight direction out to sea at Spurn changes with the azimuth angle of the sun, as would be expected if the fixed angle theory applied in this case. All that is needed is a sharp eye and a compass.

*azimuth angle — the compass heading shown by the sun (cf. the angle of elevation).

ACKNOWLEDGEMENTS

I should like to thank Mr. Barry Spence, the Warden of Spurn Bird Observatory, for his help and interest, and Messrs. Roger Harris and J. H. Flint for identifying the Syrphids and Sawflies respectively.

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THE GEOLOGY OF ILKLEY MOOR

PHILIP LAMMING

This paper forms part of the survey of Ilkley Moor which has been carried out by the Wharfedale Naturalists' Society over the past ten years.

The north facing slope of Rombalds Moor within the Ilkley U.D. boundary is composed of a series of beds of sandstone and shale largely covered by the debris resulting from their weathering, both chemical and mechanical; in addition boulder clay and gravels of glacial origin are present. The solid rocks are of Millstone Grit (Namurian) age; the lowest mapped being in the H goniatic zone and the highest in the R2 zone (Stephens *et al.*, 1953). In the area immediately to the south of the town marine rocks are recorded at four points only (Stephens *et al.*, 1942) and to these may be added a fifth found during the present survey. This occurs in Spicey Gill, upstream

from the road bridge on the Keighley Gate road (110467). The band consists of thin (approx. 1") bullions containing a variety of fossils, including goniatites, in an uncrushed state. The band is very thin, possibly no more than two inches, and the bullions, which are completely decalcified, occur within a dark gritty rock. Other rocks in the area are fossiliferous only to the extent of the usual plant remains.

Lithologically these rocks vary in grain size from coarse grits with occasional layers of pebbles of white quartz to sediments of the finest grade, with at least one thin limy band (Backstone Beck). The grits are often remarkable for their coarseness of grain size and for the freshness and abundance of the fragments of feldspar which frequently show bright cleavage surfaces. The minerals of which the grits are composed show that the rock was derived from some pre-existing granitic or gneissic mass, yet only rarely are pebbles of the original rock found within it and these are small. The finer sediments grade down to clayey rocks and all gradations can be seen in the banks of the deeper cut becks. In Backstone Beck the cyclic nature of the sediments can be seen; each cycle showing an upward transition in grain size from fine to coarse. The sandier beds of each cycle stand out slightly from the surface of the cliff. The thick sandstones, by reason of their hardness, form the cliff scarps on the moor side while the softer intervening shales are much obscured and form the less steep 'treads' between the 'steps'. It may perhaps be mentioned that the brown colour of the sandstone is due to the weathering of iron minerals. The same rock when brought up from depth, as in a borehole core, is light greenish grey in colour and contains pyrites and iron-bearing carbonates.

The general dip of the beds is to the south so that the exposed face is also the strike. This factor has contributed to the greater gradient of the south bank of the valley compared with the north, and to the formation of the conspicuous crags. No doubt at the end of the last glaciation this part of the valley would be over-steepened and on the melting of the supporting ice, land slips on a grand scale would occur. Land slipped masses are evident over the whole length of our area and the lower slopes are covered with the hummocky boulder-strewn debris. One notable slip can be seen behind White Wells where there is a great embayment in the escarpment and below, a large apron of debris. Rocky Valley represents a slip of a different form. Here a mass appears to have slipped down on a curved plane parallel with the edge of the scarp. The curvature of the slip plane has caused rotation of the slipped beds such that their dip into the hillside is greatly increased. A similar effect can be seen in beds forming the banks to Backstone Beck above the Highfield road.

Faults are common in the area and many of the scarp edges are cut and stepped by them. The area of grit behind the Cow and Calf is bounded by faults on two sides, and at the head of Backstone Beck the plane of movement of one is admirably displayed. In this case it is a transverse fault as the striations on the surface show.

The boulder clay and gravels are poorly exposed, as is to be expected, but they are seen in some of the becks and on the moor top where in the past they have been a source of limestone for burning. All the erratics are of fairly local derivation and though limestone boulders are rare they can be found if search be made.

In the course of the survey three localities were demonstrated at which base-loving plants grew. Two of these were plainly on slipped terrain and the source of the bases therefore is hard to establish. In general the rocks of the moor should give acid soils. However, the possible presence of pockets of limestone erratics might account for local basic conditions. It might also be remembered that carbonates occur in unweathered grit (Butterfield, 1934) and that these might be carried to the surface by springs to give an area of reduced acidity. At the third locality, in Spicey Gill, the rocks are *in situ* and a search was made for a limestone band similar to that in Backstone Beck. The result, as mentioned above, was the finding of a band of decalcified bullions which, insofar as the decalcification may not be complete, would constitute a source for alkalies in the water which issues from the rock face.

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THE LEPIDOPTERA OF YORKSHIRE

(continued from 1968, p. 104)

Lythria purpuraria Linn. (Purple-barred Yellow).

Not recorded in Yorkshire, or for that matter anywhere else in Britain in the twentieth century.

Rhodometra sacraria Linn. (Vestal).

This was first found in the county when S. Crooks took a specimen at M.V. light at Baildon (64) on 31st August 1961; he took a second on 19th September 1961.

Ortholita bipunctaria Schiff. (Chalk Carpet).

Confined to a few chalk districts near the east coast where it is sometimes plentiful.

61. Filey district.

62. Scarborough district; Cayton Bay, on calcareous clay cliff.

O. moeniata Scop. (Fortified Carpet).

It is a hundred years since this species was last taken in Britain, that specimen being taken near York.

O. mucronata Scop. (Lead Belle).This old species has recently been split into three and our records do not permit us to distinguish between them. On the assumption that most, if not all, Yorkshire specimens are in fact *O. mucronata* it can be said to be well distributed in the county wherever there is plenty of Gorse.*O. chenopodiata* Linn. (Shaded Broad-bar).

Well distributed and often common on railway embankments and dry grassy slopes; a dark form occurs on the Wolds (61).

Larentia clavaria Haw. (Mallow).

Recorded from a number of widely separated areas; it does not stray far from its food-plant and may not be recorded unless searched for.

62. Larvae at Runswick Bay and Seamer in 1918.

63. Shipley.

64. Harrogate, 1951; Selby, frequently at light.

Orthonama lignata Hubn. (Oblique Carpet).

Very local but there are two well-established colonies and a few odd records besides.

61. Barlby, once; Skipwith Common, well established.

64. Askham Bog, often common; Selby, 1933.

Venusia cambrica Curt. (Welsh Wave).

Local in hilly districts, provided always that its food-plant, the Mountain Ash, is available.

62. Scarborough district.

63. Hardcastle Crags, 1955; Sheffield.

64. Grassington; Harrogate, once; Malham; Pateley Bridge, 1919; Sedbergh, 1927.

Oporina filigrammaria H.S. (Small Autumnal Carpet).

Widespread in the higher moorland areas.

63. Denholm; Halifax; Meltham; Sheffield, on the moors.

64. Harrogate.

65. Richmond district.

O. autumnata Borkh. (Autumnal Moth).Probably more widely distributed than the records suggest because it is frequently confused with *O. dilutata*.

62. Hutton-le-hole, larvae in 1937 on a Y.N.U. field meeting.

63. Sheffield, frequent.

64. Grassington.

(O. chrystii Prout (Pale November Moth).We have no record for this species, presumably because it is difficult to distinguish from *O. dilutata*. It certainly would be expected to occur.)*O. dilutata* Schiff. (November Moth).

This insect is widely distributed and often common.

Asthenia albulata Hufn. (Small White Wave).

A very local species but the shortage of records is surprising as though small this moth is not inconspicuous even in daylight.

61. Cliffe Common.

62. Langdale End; Pickering.

64. Bishop Wood, scarce; Grassington, 1927 but not since.

Discoloxia blomeri Curt. (Blomer's Rivulet).

Very local and apparently now confined to the North-east of the county although there is an old record from Knaresborough (64).

62. Cayton Bay; Helmsley, 1932; Loftus, 1905; Scarborough, well-established in Forge Valley.

Hydrelia testaceata Don. (Waved Carpet).

Very local and probably no longer occurs in Yorkshire. The best known locality in Porritt's time was Edlington Wood (63) where it was common. It was last recorded there in 1909 and has not been reported in the county since.

H. flammeolaria Hufn. (Small Yellow Wave).

A very local little moth but it is still quite widespread.

61. Allerthorpe.

62. Pickering; Scarborough, in Forge Valley.

63. Edlington Wood, frequent in 1935 and in 1966 on a Y.N.U. field meeting; Wentbridge.

64. Bishop Wood.

Euchoeca nebulata Scop. (Dingy Shell).

Local in damp woods, probably more widely distributed than the records suggest.

62. Sand Hutton, 1933.

63. Wakefield.

64. Askham Bog; Bishop Wood, scarce; Bramham Park; Selby district.

Operophtera fagata Scharf. (Northern Winter Moth).

Common and widely distributed wherever there is an abundant growth of Birch.

O. brumata Linn. (Winter Moth).

Generally common and very widely distributed, it is sometimes so abundant as to be destructive.

Pelurga comitata Linn. (Dark Spinach).

Not common, but recorded sporadically from widely separated districts.

61. Barby, one in 1968; Kilnsea in 1949; Filey, 1967; Selby, formerly common.

62. Strensall, 3rd August, 1958.

63. Bradford; Otley, 1942; Saltaire; Shipley.

64. Leeds, 1959; Sedburgh, 1927.

Entephria caesiata Schiff. (Grey Mountain Carpet).

Widespread on high moorlands, most records are from the Pennines but one from Scarborough suggests that it must also occur on the North Yorkshire Moors.

62. Scarborough.

63. Denholm.

64. Brimham Rocks; Denton Moors; Grassington; Ilkley Moors.

E. flavicinctata Hubn. (Yellow Ringed Carpet).

There is one well-known locality where this local moth is really well established but records from two other areas would be worth following up.

62. Scarborough, there is an old record but nothing recent.

64. Grassington, usually abundant in the valley at the foot of Dib Scar; Oughtershaw in Langstrothdale.

Epirrhoe galiata Hubn. (Galium Carpet).

Although local and not generally common it has been recorded from widely separated areas. It is well established on the limestone at Grassington (64) but rather surprisingly it has not been reported from the Pickering and Scarborough area (62).

61. Kilnsea.

63. Halifax; Huddersfield; Sheffield, rare; Wakefield, 1946.

64. Burley; Grassington, not uncommon on the limestone pavements; Harrogate, one, 30th June 1961; Knaresborough, one, 30th June 1956; Bentham, on a Y.N.U. visit in 1935.

E. rivata Hubn. (Wood Carpet).

There are no records since the Second World War but several from the period between the wars. Although not easily distinguished from the next species its presence in the county should be reconfirmed.

63. Doncaster, in Wheatley Wood in the 1930's but the wood has since been felled and built on; Edlington and Wadworth Woods, about 1919; Huddersfield district about 1923.

E. alternata Mull. (Common Carpet).

Well distributed and often common, particularly where there is plenty of Bedstraw.
ab. *pseudo-rivata* was taken at Thixendale (61) on 30th July 1965.

E. tristata Linn. (Small Argent-and-sable).

Local on high moorlands, particularly along the borders of woods.

62. Levisham.

63. Chevet near Wakefield; Deffer Wood, common; Denton.

64. Dallowgill Moors.

Euphyia unangulata Haw. (Sharp-angled Carpet).

There are no recent records and it is quite possible that early records were erroneous, the last two were in the first decade of the twentieth century: Everingham (61) and Bolton Woods (64).

E. bilineata Linn. (Yellow Shell).

Generally distributed and often common, even in gardens and urban areas. It does not always enter M.V. traps in any numbers so that its presence may not be established by this means.

E. rubidata Fabr. (Ruddy Carpet).

Not recorded since Porritt's List.

E. polygrammata Borkh. (Many Lined).

Not recorded since Porritt's List.

Eulype hastata Linn. (Argent and Sable).

A very local insect, not often recorded since the war.

62. Pilmoor, 1948; Strensall, 1955.

63. Deffer Wood, 1953; Kirkburton, 1940, on a Y.N.U. meeting; Wadworth Wood, 1958; Wakefield, 1918 and 1946.

64. Askham Bog, 1950; Bishop Wood, frequently in recent years; Bolton Percy, 1943; Temple Newsam, 1944.

Mesoleuca albicillata Linn. (Beautiful Carpet).

Fairly well distributed in the larger woods.

61. Selby district; Skipwith Common.

62. Buttercrambe Wood; Pickering; Robin Hoods Bay, 1946; Thornton-le-dale, 7th June 1953.

64. Bishop Wood, frequent; Grassington, frequent; Selby district.

Lyncometra ocellata Linn. (Purple Bar).

Widely distributed but not common.

61. Skipwith Common; Spurn.

62. Scarborough.

63. Halifax.

64. Burley Woodhead; Colsterdale, 1958, at a Y.N.U. meeting; Grassington; Harrogate.

Plemyria bicolorata Hufn. (Blue-bordered Carpet).

A local insect which is not often recorded except in one or two districts.

61. Skipwith Common, up till about 1955.

62. Pilmoor, 12th August 1968.

63. Flocton, 1939.

64. Askham Bog, common; Bishop Wood, up to 1955; Copgrove, 1959; Harrogate, uncommon.

Perizoma affinitata Steph. (Rivulet).

A local insect, but sometimes common where it occurs.

61. Filey, 1966 and 1967.

62. Pickering; Scarborough, in Forge Valley.

63. Skelmanthorpe, 1924.

64. Harrogate; Knaresborough; Malham.

65. Richmond.

P. alchemillata Linn. (Small Rivulet).

Much commoner than the last species and with a more general distribution.

61. Filey; Selby area; Skipwith Common.

63. Bradford; Halifax; Normanton, 1910.

64. Askham Bog; Grassington; Harrogate; Knaresborough; Selby area.

P. flavofasciata Thunb. (Sandy Carpet).

Rather local but not uncommon, its distribution is restricted to areas where the food-plant *Lychnis dioica* (Red Campion) grows freely.

61. Selby district; Skipwith Common.

63. Bradford; Halifax; Wakefield.

64. Far Headingley; Harrogate; Knaresborough; Selby area.

P. albulata Schiff. (Grass Rivulet).

Restricted to localities in which the food-plant *Rhinanthus crista-galli* (Yellow Rattle) grows in plenty but in such places it is often common.

61. Kilnsea; Selby District.

62. Scarborough; Strensall Common.

63. Bradford; Huddersfield.

64. Harrogate; Malham, 1910; Micklefield; Leeds, 1956.

P. bifasciata Haw. (Barred Rivulet).

Only two localities have been reported, in both of these it is well established. There seems little doubt that it would be found in other districts in which the food-plant *Odontites verna* (Red Bartsia) grows freely; it is usually taken as a larva in the autumn rather than as a moth when on the wing.

61. Kilnsea, August 1949, a single specimen taken at light by H. N. Michaelis was a new Yorkshire record. The larvae have been common in the district in recent years.

62. Scarborough, larvae plentiful in 1959.

P. minorata Treits. (Heath Rivulet).

The only known locality in the county is at Grassington (64) where it is sometimes abundant on the grassy slopes above Dib Scar; even there however it is extremely localised and of very erratic appearance.

P. taeniata Steph. (Barred Carpet).

This species too has only one known locality in the county, only a few hundred yards from the last species. It inhabits the boulder-strewn valley below Dib Scar (64) where it is generally scarce and difficult to find.

Hydriomena furcata Thunb. (July Highflier).

Widely distributed in woods and on commons and heaths and often very common.

A small race feeding on Bilberry occurs on most of the higher moors.

H. coerulata Fabr. (May Highflier).

Fairly widespread and often common where there is plenty of Alder.

61. Filey; Selby district; Skipwith Common.

62. Hutton-le-hole; Thornton Dale.

63. Horbury, 1925.

64. Askham Bog; Harrogate; Washburndale, 1939.

H. ruberata Frey. (Ruddy Highflier).

Local and not often recorded, it may sometimes be mistaken for a large specimen of the previous species.

61. Skipwith Common, larvae regularly.

62. York district, in the 1940's and one in 1964.

63. Doncaster.

64. Harrogate, one 28th May 1964.

Earophila badiata Hubn. (Shoulder Stripe).

Now somewhat localised but still widespread and not uncommon, mainly in areas of scrub and overgrown hedges where there is plenty of wild rose.

Coenoteaphria berberata Schiff. (Barberry Carpet).

Not recorded since Porritt's List.

C. derivata Schiff. (Streamer).

Presumably restricted in range by the availability of the food-plant, the wild rose, but it cannot surely be as uncommon as the available records suggest.

61. Cliffe Common; Filey.

64. Bishop Wood; Grassington; Harrogate; Knaresborough; Malham, 1911.

Nyctostia obstipata Fabr. (Gem).

This little migrant does not often venture so far North but there are quite a number of records in the last twenty years.

61. Muston near Filey, one in 1966.

63. Dalton, one, 31st July 1950 and one, 3rd August 1950; Sheffield, September 1949; Triangle near Halifax, 16th October 1959.

64. Harrogate, one, 12th August 1959 and one 23rd October 1960; Selby, one, 15th September 1947.

FRANCIS CAVERS, D.Sc., F.L.S. (1876-1936)

G. A. SHAW

Although it is rather late in the day to be writing what is in effect an obituary notice some thirty years after his decease and some sixty years after the cessation of his association with Yorkshire, I feel that some memorial should be written to commemorate the late Francis Cavers, former bryologist. From 1901 to 1903 Cavers was Assistant Lecturer in Biology at the Yorkshire College, Leeds. During this period (and up to 1907) he published some important papers on the Hepaticae in *The Naturalist*. At the time of his death in 1936, Cavers had been away from Yorkshire for some thirty years and no obituary notice appeared in *The Naturalist*. It is in an attempt to remedy this deficiency that this paper has been written.

The name of F. Cavers is known to botanists chiefly for his paper 'On the Structure and Biology of *Fegatella conica*', published in *Annals of Botany*, Vol. XVIII, Jan. 1904, and for his monumental paper 'The Inter-Relationships of the Bryophyta', in *New Phytologist*, Vol. IX (1910) and Vol. X (1911). Although obituary notices appeared in *Nature*, 20 June 1936, in *Chronica Botanica*, Vol. 3, 1937, and in *Annales Bryologici*, Vol. 9, 1936, these have no details of his earliest years beyond the fact that he was born in Hawik in 1876. All the obituaries speak of his quiet, unaffected manner and great personal charm, his devotion to his work and his eagerness to encourage young research workers. The only personal notes I am able to add are the recollections of a former student of Cavers' in the years 1910-11 (Miss F. M. Loader, of Southampton) who writes: 'Of course, I remember Professor Frank Cavers very well — he was at the old Hartley University College when I was first a student — only for one year 1910-11 — then naturally I was young and in those days there was an appropriate respect on the part of young students for the Professor so I did not know him intimately. I have no idea how long he was in the Chair, but I do know he left in the summer of 1911, after my first session, and then he became a medical student and practised as a doctor, I believe in the London district — whether he was married or not I cannot say. Prof. Cavers was rather reserved, a gentle type, kindly and courteous, and always ready to help. I do remember at some date reading an obituary notice of his death, but have no idea if this was before, during or after World War II. I should think he was a man of about 40 when I was 17, and as I am now nearly 71 he probably died some little time ago — he was not a strong hearty man. All other members of the staff of his period have now died so that there is nobody left from whom I can get information. I did not know that he had been at Leeds before coming to Southampton. Of course you are familiar with his N.P. reprint on the Bryophyta. I should think that dates back to 1906 or 1908, but I am not sure'.

Through the kindness of Dr. T. E. Wallis, of Mill Hill, London, N.W.7, I am able to reproduce a letter written to him by Cavers in 1912:

'Dear Sir,

On returning from the holidays, I have just seen in the *New Phytologist* your interesting note on the *Pellia* capsule, and was also pleased to see that you thought so well of the short account of this type given in the little "Practical Botany" text-book — the original account was about three times as long, with about twice as many figures, and the whole book was originally planned on that scale, but had to be severely pruned down to meet the demands of the publishers, unfortunately! Your account of the actual process of dehiscence is certainly quite new and most interesting, but we were *both* forestalled with regard to the dehiscence-lines, which were described in 1899 by Andreas, a pupil of Goebel's, in his "Inaugural Dissertation" for the Ph.D. degree at Munich (reprinted in *Flora*, 1899). His description is very brief, however. The curious thing is that apparently no previous writer had noticed these very striking dehiscence-lines, but things of this kind are often overlooked, and of course it is always worthwhile making a close examination of even the commonest plants. There is plenty of room for interesting work on *Pellia*, e.g. details of development of the capsule in the earlier stages — this has recently been touched on by an American writer, but very inadequately. If you think of taking up detailed work on *Pellia* or other Hepaticae, I shall be very glad indeed to offer any assistance in the matter of the literature — I believe I have tracked down everything that has been published on the morphology of this group, because I found it a fearfully difficult business to get results worth publishing until this literature-hunting was done, and it has taken a lot of trouble I can assure you.

Yours faithfully, F. Cavers.'

Summary of Career

- 1876 Born Hawick.
 1894-97 Armstrong College, Newcastle upon Tyne.
 1897-1900 Imperial College of Science, London.
 In the Session 1899-1900 Cavers was awarded the Edward Forbes bronze medal and Prize of Books for Biology, and also the Marshall Scholarship. The former was provided by the Trustees of the Edward Forbes memorial fund, to be awarded to the student who does best in biology; the latter was founded by Miss Sarah Marshall in honour of her father, the late Mr. Matthew Marshall, of the Bank of England, and awarded annually to a student engaged in biological research in the Huxley Laboratory. The funds for this Scholarship are supplied from the interest of £1,000 left by Miss Marshall for its endowment. We learn, however, from Professor Farmer's Annual Report for 1899-1900, that Mr. Cavers's appointment as Junior Demonstrator in Botany at Owens College, Victoria University, necessitated his resignation of the Marshall Scholarship. He was also recommended for an Exhibition, but was 'disqualified by age'.
- July 1900 A.R.C.S.
 1900-1 Demonstrator in Botany, Owens College, Manchester.
 July 1901 B.Sc. (Lond.).
 1901-3 Assistant Lecturer in Biology, Yorkshire College, Leeds.
 1903 F.L.S. (ceased to be a Fellow in 1917).
 1903-4 Lecturer in Biology, Technical College, Plymouth.
 1904 D.Sc. (Lond.) (By a thesis entitled, 'Contributions to the Biology of the Hepaticae'). It is interesting to note that in the following year D.Sc.'s were awarded to Agnes Arber, Felix Eugene Fritsch and Marie C. C. Stopes.
- 1904-11 Professor of Biology, Hartley University College, Southampton.
 1911-12 Lecturer in Botany, School of Pharmacy, University of London. (Actual dates, Oct. 1911-July 1912 — see *Pharmaceutical Journal*, 7 Oct. 1911 and 6 July 1912).
 1911-15 Reader in Botany at Goldsmith's College, University of London.
 1913-16 Assistant Editor, *The New Phytologist*. First Editor, *Journal of Ecology*.
 1915-18 University College Hospital, London.
 1918 M.R.C.S., L.R.C.P.
 1918-25 In medical practice at 42 Hamilton Road, Highbury, London N.5.
 1928 Living at Willian, Letchworth, Herts.
 1929-36 Living at Oakfield, Knebworth, Herts.
 1936 Died 26 May.

Publications

1903

- A new Species of *Riella* (*R. capensis*) from South Africa. *Rev. Bryol.* **1903**, 5: 81-4.
 On Saprophytism and Mycorrhiza in Hepaticae. *New Phytol.* **2**: 30-5.
 On asexual Reproduction and Regeneration in Hepaticae. *New Phytol.* **2**: 121-33, 155-65.
 Some Points in the Biology of Hepaticae. *Naturalist* **1903**: 169-75, 208-15.
 Notes on Yorkshire Bryophytes. I. *Petalophyllum ralfsii*. *Naturalist* **1903**: 327-34.
 Notes on Yorkshire Bryophytes. II. *Pallavicinia flotowiana*. *Naturalist* **1903**: 441-4, 451-5.
 Explosive Discharge of Antherozoids in *Fegatella conica*. *Ann. Bot.* **17**: 270-4.
 Explosive Discharge of Antherozoids in Hepaticae. *Torreya* **3**: 179-82.

1904

- On the Structure and Development of *Monoclea Forsteri*. *Rev. Bryol.* **1904**, 4: 69-80.
 On the Structure and Biology of *Fegatella conica*. *Ann. Bot.* **18**: 87-120.
 Contributions to the Biology of the Hepaticae. Part I., *Targionia*, *Reboulia*, *Preissia*, *Monoclea*. Privately printed by Chorley and Pickersgill, The Electric Press, Leeds and London. (I have not seen Part II, if such was ever published.)
 Notes on Yorkshire Bryophytes. III. *Reboulia hemisphaerica*. *Naturalist* **1904**: 208-14, 242-50.

1907

Notes on Yorkshire Bryophytes. IV. *Frullania* and *Jubula*. *Naturalist* 1907: 11-16, 46-9.

Plant Biology. University Tutorial Press: London, 1907.

Hepaticae. *Bradford Sci. Journ.*, 2, 14: 33-7 (Oct. 1907).

Life Histories of Common Plants. University Tutorial Press: London, 1908.

1909

Contributed 5 chapters to Vol. 4 of *The Book of Nature Study* (6 vols.) edited by J. B. Farmer, M.A., D.Sc. (OXON.), F.R.S. Chapter IV — Ferns and their Relatives.

Chapter V — Mosses and Liverworts. Chapter VI — The Higher Fungi. Chapter

VII — Lichens. Chapter VIII — Moulds, Yeast, Bacteria.

Botany for Matriculation. University Tutorial Press: London, 1909.

1910

The Senior Botany. University Tutorial Press: London, 1910.

The Life History of a Peat-Moss. *Knowledge*, 1910. ?-268, 294-301.

1911

The Inter-relationships of the Bryophyta. *New Phytol.* 9: 81-112, 157-86, 193-234, 269-304, 341-53. *New Phytol.* 10: 1-46, 84-6.

Practical Botany. University Tutorial Press: London, 1911.

1912

Recent work on the Bryophyta. *New Phytol.* 11: 265-76.

1913

Recent work on Flagellata and Primitive Algae. *New Phytol.* 12: 28-36, 78-83, 107-23, 177-87, 225-32.

1914

Gola's Osmotic Theory of Edaphism. *Journ. Ecol.* 2, 4: 209-31.

Chondriosomes (Mitochondria) and their Significance. *New Phytol.* 13: 96-106, 170-80.

1915

Junior Botany. University Tutorial Press: London, 1915.

School Certificate Botany. University Tutorial Press: London.

The Inter-Relationships of Protista and Primitive Fungi. *New Phytol.* 14: 94-104, 164-8, 223-7, 275-80, 302-4.

This is the sum total of the information I have been able to gather about Cavers. I realise only too well that there are gaps in my account of this somewhat enigmatic man; one wonders, for instance, why he left teaching and bryology at such an early age. The only inkling one gets that perhaps Cavers was not completely at home in teaching is Tansley's statement in the obituary in *Nature* that 'he was not, however, in all respects well fitted for such work'.

For assistance in my search for information on Professor Cavers I am greatly indebted to Mr. F. E. Branson, Mr. A. D. Greenwood, Miss F. M. Loader, Mrs. Jean Paton, Prof. J. Proskauer, Mrs. J. Pingree (Archivist to the Imperial College of Science), Dr. T. E. Wallis, Dr. E. V. Watson; The School of Pharmacy, University of London; the Information Officer of the British Medical Association; and the Clerk to the Knebworth (Herts.) Parish Council.

Dr. E. V. Watson, of the Botany Department, University of Reading, has very kindly written the following note on Cavers, for which I am most grateful.

Dr. Frank Cavers

Mr. G. A. Shaw has asked that I write a brief assessment of the bryological contribution of the late Frank Cavers, D.Sc. This is not altogether easy, particularly in view of the very different 'climate of thought' prevailing in botany to-day from that which held when Cavers wrote his most important papers, some 60 years ago.

By far his most bulky contribution to bryology and the one by which he is best known, is 'The Inter-relationships of the Bryophyta'. This was, in fact, a reprint in book form (*New Phytologist* Reprint, no. 4) of a series of papers which had appeared over a period of several years. It is at once a masterly survey of the morphology of the

Bryophyta in the light of the facts available at that time and a challenging attempt to interpret this wealth of morphological detail in a phylogenetic manner.

It is this second part of the author's purpose and achievement which has, I believe, been responsible for the decidedly lowered estimate of his overall contribution which one finds not uncommonly to-day. It is fashionable, especially for American bryologists of 'advanced' views, to decry the work of Cavers, even to the point of regarding him as putting the brake on the progress of bryology in Britain. In my view this is a grossly unfair appraisal of one whose achievement, in the short period of years over which he devoted a part of his time to bryology, was truly remarkable.

Like many others of his generation Cavers may indeed be accused, with a certain justice, of putting a too facile phylogenetic interpretation upon the known facts; and his whole viewpoint in this respect stands in direct contrast to the mood of caution in such matters that prevails to-day. There is, however, no mistaking the penetrating observation, the urge wherever possible to experiment and the invariably lucid exposition that characterised his work. Perhaps these qualities are even more apparent in the series of papers that appeared in *The Naturalist* in 1903-4, less than four years after the time when he had heard the lectures of Professor J. B. Farmer which he declared were his main source of inspiration. These early accounts in *The Naturalist* contain wonderfully full and accurate information on such liverworts as *Targionia hypophylla*, *Reboulia hemisphaerica* and others. They can be re-read to-day with profit. The same is true of his detailed account of the morphology of *Conocephalum conicum* (*Fegatella conica*) that appeared in the *Annals of Botany*, 1904. His chief interest lay with the Hepaticae.

It is important, when trying to assess the contribution of Cavers, to remember that he turned away from bryology and even from botany altogether, at a comparatively early age. Almost his entire bryological contribution was made between 1903 and 1912. After 1916 he ceased to be Editor of the *Journal of Ecology* and appears to have played little further part in botanical affairs. His qualification as a medical doctor, after several years of arduous study, led to a period of useful and lucrative practice in north London, whereafter he was able to retire. In the last period of his life he became deeply involved in the subject of cancer and was successively editor of the *Cancer Review* (1925-32) and of the *American Journal of Cancer* (1932-6).

Long before this period Cavers had ceased to be an active figure in British botany. By 1912 he had not only made all his leading bryological contributions but he had also written six out of the seven elementary textbooks which between them must have brought his name before a far wider botanical public. When one bears in mind that throughout this productive period he was teaching continuously in Institutions of higher education one has to admit that the sheer bulk of his output was remarkable. Much of it was of very high quality too. His *Practical Botany* ran through four editions and my own experience is that even to-day it is a useful book. Its great merit lies in the emphasis on direct, personal observations of plants and their tissues which was so much an integral part of the outlook of its author. One feels that here, as with his bryological work, he lived very close to his material. Yet at the same time, every bryological paper that Cavers wrote is conspicuous for its careful mastery of the relevant literature. He was exceedingly widely informed.

In the circumstances it is tempting to speculate as to what would have been the stature of the man had he, as it were, 'stayed in' botany and continued with bryological studies as a principal research interest. Had he both done this and also lived to a 'ripe old age' then his contributions could easily have extended into the period after World War II which witnessed a noticeable upsurge of interest in bryology in Great Britain. Wholly new techniques and a wealth of freshly acquired knowledge would have become available to him. With his gifts of acute observation and painstaking thoroughness of industry he might indeed have stood out as a great 'doyen' among bryologists of that time.

Even as things are, the work he did and the views he held — for example on the 'antithetic theory' of bryophyte origin — even if unfashionable to-day, are still talking points wherever bryophyte inter-relationships are discussed. His judgment of the facts before him may at times have been faulty, his conclusions in modern eyes too sweeping or dogmatic, but the sureness of his observation and his great power of marshalling a multiplicity of facts are clear enough indications of an exceptionally gifted man. He earned, and has retained, a sure place in the history of bryology in Britain.

BRYOLOGICAL MEETING AT HAYBURN WYKE, V.C. 62

21-22 September 1968

F. E. BRANSON

The results obtained from the meeting at Hayburn Wyke were, on the whole, rather disappointing. Most of the area was quite overgrown and the majority of the species found were ordinary inland species. No maritime species were found, although we had in mind *Grimmia maritima* which was formerly recorded near Scarborough (Black) and near Saltburn (Mudd) (see Baker's *North Yorkshire*).

The first day was spent at Hayburn Wyke, following the very muddy track down from the disused railway station to the shore. Because of the dense undergrowth we had to keep mainly to the path and its sides. The best locality was on the banks of the stream just before it poured over the cliff on to the shore. There were some limestone cliffs bordering the stream which bore patches of *Leiocolea turbinata* and *Eucladium verticillatum*. It was pleasing to find *Frullania dilatata* on tree trunks in a couple of places, and while examining a piece of *Hypnum cupressiforme* var. *resupinatum* which I had collected from the base of a tree trunk I found this species and the only *Metzgeria furcata* detected on the excursion mixed with it. There was quite a large amount of *Barbula cylindrica* on rocks by the stream banks and I also collected some fine *Barbula spadicea*. A small gully leading from the shore inland and filled with a tangle of woodland had some fruiting *Hookeria lucens* and *Eurhynchium praelongum* var. *stokesii* growing in it. The only moss seen near the sea was *Bryum bicolor* on a clay bank on the shore. Walking back up from the shore I gathered a pleurocarpous moss from turf at the side of the path, thinking it was *Campylium stellatum*, only to find later, on microscopical examination, that it was a compact form of *Eurhynchium praelongum* which I often come across in similar situations (i.e. in grassland) and by which I have before been misled. In the evening we went to the disused Hayburn Wyke railway station. Such a place is always interesting bryologically as many of the small acrocarps find a place on the tarmac and fine ash with which the platform is usually covered. On the actual platform a small *Riccia* was found which I afterwards determined as *R. sorocarpa* and this was agreed to by Mrs. J. A. Paton. Along the side of the track was some fruiting *Pohlia annotina* with its glove-shaped bulbils and on the wall lining the track some fruiting *Orthotrichum diaphanum* and later, at home, I was able to determine a small plant as *Barbula rigidula*. I also had *Isoetecium myosuroides* from a small wood nearby.

On Sunday morning we visited a large quarry near Ravenscar. This was the best place of the whole excursion. The two dominant ground species were both hepatics and both low-growing, viz., *Gymnocolea inflata* and *Nardia scalaris*. There was some fruiting *Bryum pallens* a moss which very seldom produces capsules, scattered about the quarry, also some fine *Ptilidium ciliare* in reddish-brown, lax, patches, and I was pleased to find some *Trichostomum brachydontium*, a moss often found near our coasts. This was the type, although the var. *littorale* is said to be commoner in such situations. Mrs. Gow found a little *Cephalozia media* growing on a stem of *Rhytidiadelphus squarrosus* and Miss Dalby collected *Plectocolea hyalina*. In the afternoon the party went to Staintondale railway station and bryologised along the disused railway track. In a stubble field there was a prolific display of *Pottia truncata* (c.fr.) and in various places along the track I saw *Trichostomum crispulum*, *Eurhynchium murale* (c.fr.) and *Racomitrium fasciculare*, among many others. Miss Dalby had *Racomitrium heterostichum* from here.

Miss Dalby collected and determined the following *Sphagna* from the top of Stoupe Brow, Ravenscar: (Grid Ref. 970012).

<i>Sphagnum recurvum</i>	<i>S. plumulosum</i>
<i>S. capillaceum</i>	<i>S. subsecundum</i> var. <i>auriculatum</i>
<i>S. cuspidatum</i> (submerged)	<i>S. compactum</i>
<i>S. tenellum</i>	<i>S. papillosum</i>
<i>S. fimbriatum</i>	

Lists for the various localities visited are appended below. Acknowledgements are due to Mrs. J. A. Paton, Mr. J. H. Field and Mr. E. R. B. Little for checking various gatherings. Nomenclature follows *Census Catalogue of British Mosses* (3rd edition) by E. F. Warburg for mosses, and *Census Catalogue of British Hepatics* (4th edition) by J. A. Paton for hepatics.

Hayburn Wyke and Hayburn Wyke railway station:

<i>Conocephalum conicum</i>	<i>Dicranoweissia cirrata</i>
<i>Lunularia cruciata</i>	<i>Dicranum scoparium</i>
<i>Riccardia multifida</i>	<i>Campylopus pyriformis</i>
<i>R. sinuata</i>	<i>Tortula muralis</i>
<i>R. pinguis</i>	<i>Barbula convoluta</i>
<i>Pellia epiphylla</i>	<i>B. unguiculata</i>
<i>P. neesiana</i>	<i>Grimmia apocarpa</i>
<i>P. endiviifolia</i>	<i>G. pulvinata</i>
<i>Metzgeria furcata</i>	<i>Orthodontium lineare</i>
<i>Lepidozia reptans</i>	<i>Pohlia nutans</i>
<i>Calypogeia fissa</i>	<i>P. delicatula</i>
<i>C. arguta</i>	<i>Bryum capillare</i>
<i>Lophozia ventricosa</i>	<i>B. pallens</i>
<i>Nardia scalaris</i>	<i>B. argenteum</i>
<i>Plagiochila asplenoides</i> and var. <i>major</i>	<i>Mnium hornum</i>
<i>Lophocolea cuspidata</i>	<i>M. undulatum</i>
<i>L. heterophylla</i>	<i>M. punctatum</i>
<i>Chiloscyphus polyanthos</i>	<i>Philonotis fontana</i>
<i>Cephalozia bicuspidata</i>	<i>P. caespitosa</i>
<i>Diplophyllum albicans</i>	<i>P. calcarea</i>
<i>Scapania umbrosa</i>	<i>Cratoneuron commutatum</i> var. <i>commutatum</i>
<i>S. undulata</i>	<i>Amblystegium serpens</i>
<i>S. nemorea</i>	<i>Acrocladium cuspidatum</i>
	<i>Isoetecium myurum</i>
<i>Atrichum undulatum</i>	<i>Camptothecium sericeum</i>
<i>Polytrichum piliferum</i>	<i>Brachythecium rutabulum</i>
<i>P. juniperinum</i>	<i>B. rivulare</i>
<i>P. commune</i>	<i>Isopterygium elegans</i>
<i>Fissidens bryoides</i>	<i>Plagiothecium denticulatum</i>
<i>F. taxifolius</i>	<i>P. undulatum</i>
<i>Ceratodon purpureus</i> var. <i>purpureus</i>	<i>Hypnum cupressiforme</i>
<i>Dicranella varia</i>	<i>Ctenidium molluscum</i>
<i>D. heteromalla</i>	<i>Rhytidadelphus squarrosus</i>
<i>Dichodontium pellucidum</i> and var. <i>flavescens</i>	

Quarry at Stoupe Brow, nr. Ravenscar (Grid Ref. 960023):

<i>Pellia epiphylla</i>	<i>Dicranella heteromalla</i>
<i>Lepidozia reptans</i>	<i>Dicranum majus</i>
<i>Calypogeia muellerana</i>	<i>D. scoparium</i>
<i>C. arguta</i>	<i>Rhacomitrium lanuginosum</i>
<i>Lophozia ventricosa</i>	<i>Pohlia nutans</i>
<i>Barbilophozia floerkei</i>	<i>Mnium hornum</i>
<i>Lophocolea bidentata</i>	<i>Philonotis caespitosa</i>
<i>Cephalozia bicuspidata</i>	<i>Acrocladium cuspidatum</i>
<i>Diplophyllum albicans</i>	<i>Camptothecium sericeum</i>
	<i>Brachythecium rutabulum</i>
<i>Sphagnum palustre</i> 	<i>B. rivulare</i>
<i>S. recurvum</i>	<i>Pleurozium schreberi</i>
<i>Polytrichum urnigerum</i>	<i>Isopterygium elegans</i>
<i>P. formosum</i>	<i>Hypnum cupressiforme</i> and var. <i>ericetorum</i>
<i>P. commune</i>	<i>H. lindbergii</i>

Staintondale railway station:

<i>Pellia endiviifolia</i>	<i>Grimmia apocarpa</i>
<i>Riccardia sinuata</i>	<i>G. pulvinata</i>
	<i>Camptothecium sericeum</i>
<i>Fissidens bryoides</i>	<i>Brachythecium rutabulum</i>
<i>F. taxifolius</i>	<i>Eurhynchium praelongum</i>
<i>Ceratodon purpureus</i> var. <i>purpureus</i>	<i>Plagiothecium succulentum</i>

SPRING FORAY AT RIPON, MAY 1968

W. G. BRAMLEY

Once again there was a small attendance at the Spring Foray, only seven answering the roll. If few in numbers quite a lot of work was put in and the assiduous collecting by Dr. Watling and Dr. Richardson is mainly responsible for the list.

Grantley Hall and Spa Gill were visited on Friday, 10th May, Tanfield Lodge and Hackfall on Saturday. The grounds of Grantley were visited again on Sunday followed by investigation of some of the woods in the vicinity of Winksley. On Monday an hour or two was spent at Fountains Abbey and the party dispersed soon after lunch.

It will be noted that many of the records are marked as not in the Yorkshire Catalogue. This is now thirty years old and many advances have been made in that time. Many of these have been recorded in the pages of *The Naturalist*. In the last two years much attention has been paid by the above-mentioned members to the coprophilous fungi and there is no doubt that a great many of these species could be found nearly everywhere in the county on this substrate. The same applies to the aquatic hyphomycetes, a list of which has been provided by Dr. Webster.

At Fountains a quantity of *Sclerotinia* was found only under clumps of *Symphytum* and is referred to *S. sclerotiorum*. In all cases the sclerotia were buried up to 1-2 cm. deep in the ground and none in the old stems lying on the ground.

I have to thank Dr. Hering for a list of his identifications, and Mr. W. D. Graddon for confirmation of some of the discomycetes. To Dr. Webster and Mr. Collinge my gratitude for finding accommodation and transport which enabled me to attend three days at the last moment.

F = Fountains Abbey	G = Grantley Hall
T = Tanfield Lodge and Hackfall	W = Winksley
S = Spa Gill	
(d) = deer dung (?Fallow)	(r) = rabbit dung
(s) = sheep dung	

† Not listed in *Catalogue of Yorkshire Fungi*.

PHYCOMYCETES (M. Richardson)

Pilaira anomala (Ces.) Schroet., G.T. (r)
Piptocephalus repens de Bary, S (d)

DISCOMYCETES (M. Richardson, W. G. Bramley, T. Hering)

† <i>Ascobolus albidus</i> , S (d), T (r), W (r)	<i>D. grevillei</i> on <i>Symphytum</i> , F.
† <i>A. crenulatus</i> , G (r)	<i>Lasiobolus ciliatus</i> , S (d), T (r)
† <i>A. degluptus</i> , S (d), T (s)	† <i>Micropodia pteridina</i> on <i>Pteridium</i> , T
† <i>A. immersus</i> , T (s), W (r)	<i>Morchella esculenta</i> , W
<i>A. stictoides</i> , G (r)	† <i>Peziza anthracophila</i> , F.G.
<i>Ascophanus microsporus</i> , T (s)	† <i>P. praetervisa</i> , G
† <i>Ascozonus woolhopensis</i> , G (r), T (r)	† <i>Pyrenopeziza digitalina</i> on <i>Digitalis</i>
† <i>Corynella prasinula</i> with <i>Dendrostilbe</i>	stems, G
on <i>Fagus</i> , G	† <i>Saccobolus versicolor</i> , G (r)
<i>Dasyscypha apala</i> on <i>Juncus</i> , T	<i>Sclerotinia sclerotiorum</i> , F
† <i>D. brevipila</i> on <i>Ulmus</i> , T	† <i>Thelebolus nanus</i> , T (r, s), S (d)
<i>D. clandestina</i> on <i>Chamaenerion</i> , G.T.	<i>T. stercoreus</i> , G (r)

PYRENOMYCETES (W. G. Bramley, M. Richardson, T. Hering, J. Webster)

<i>Cryptospora suffusa</i> on <i>Alnus</i> , G	<i>P. setosa</i> , S (d)
† <i>Diaporthe arctii</i> on <i>Arctium</i> , G	<i>Quaternaria quaternata</i> on <i>Fagus</i> , T
<i>D. eres</i> on <i>Rosa canina</i> , G	† <i>Sporormia ambigua</i> , T (r)
<i>D. taleola</i> on <i>Quercus</i> , G	<i>S. intermedia</i> , G (r), S (d, r), T (r),
† <i>Didymella applanata</i> on <i>Rubus idaeus</i> , G	W (r)
<i>Hypoxyton howeianum</i> (sensu Muller	<i>S. minima</i> , T (s)
on <i>Prunus spinosa</i> , G	† <i>S. octomera</i> , S (r)
<i>Podospora curvula</i> , T (r), S (d)	† <i>Sydowiella fenestrans</i> on
<i>P. decipiens</i> , W (r)	<i>Chamaenerion</i> , G.T
<i>P. minuta</i> , S (r), T (r, s), W (r)	

AGARICALES (R. Watling)

- | | |
|--|---------------------------------------|
| † <i>Conocybe vexans</i> , G | † <i>Melanoleuca adstringens</i> , G |
| † <i>Coprinus angulatus</i> , G, W | † <i>Nolanea cetrata</i> , T, W |
| † <i>C. bisporus</i> , G, T | † <i>N. vernus</i> , on moss, G |
| † <i>C. domesticus</i> , G, T | † <i>Panaeolus foenisecii</i> , W |
| † <i>C. ephemerus</i> , G, T (r) | † <i>Panus torulosus</i> , T |
| † <i>C. erythrocephalus</i> , F | † <i>Pluteus splendidus</i> , W |
| † <i>C. heptemerus</i> , G (r), S (d) | † <i>Psathyrella albidula</i> , T |
| † <i>C. lagopides</i> , G | † <i>P. obtusata</i> , G, S |
| † <i>C. macrocephalus</i> , G, W | † <i>P. vernalis</i> , W |
| † <i>C. miser</i> , W | † <i>Pseudohiatula stephanocystis</i> |
| † <i>C. patouillardii</i> , S (d) | † <i>P. tenacella</i> |
| † <i>Galerina ampullaceocystis</i> , W | |

It is nearly impossible to sort out the last two records, as they may have been properly listed as *Marasmius conigenus* or *M. esculentus*.

APHYLLOPHORALES, ETC.

- | | |
|---|-----------------------------------|
| <i>Polyporus sulphureus</i> on <i>Araucaria</i> , G | <i>Tremella foliacea</i> , G |
| <i>Pistillaria uncialis</i> on <i>Heracleum</i> , G | <i>Scleroderma verrucosum</i> , T |
| <i>Trametes gibbosa</i> , F, T | |

AQUATIC HYPHOMYCETES (J. Webster), all from Grantley

- | | |
|-----------------------------------|--------------------------------|
| <i>Alatospora acuminata</i> | <i>Lemonniera brachycladia</i> |
| <i>Anguillospora crassa</i> | <i>Pyricularia aquatica</i> |
| <i>A. longissima</i> | <i>Tetrachaetum elegans</i> |
| <i>Articulospora tetraccladia</i> | <i>Tetraccladium setigerum</i> |
| <i>Clavariopsis aquatica</i> | <i>Tricladium angulatum</i> |
| <i>Flagellospora curvula</i> | <i>T. splendens</i> |
| <i>Heliscus longibrachiatu</i> | <i>Varicosporium elodeae</i> |

OTHER HYPHOMYCETES (T. Hering)

- | | |
|--|---|
| <i>Coniothyrium fuckelii</i> on <i>Rubus</i> , G | † <i>Myxosporium roumegueri</i> on <i>Corylus</i> , W |
|--|---|

AUTUMN FORAY AT WREA HEAD, SEPTEMBER 1968

W. G. BRAMLEY

The autumn foray of 1968 was somewhat of a departure from normal, being designed especially for those with little or no knowledge of fungi. Altogether some twenty-five members and students spent a weekend at Wrea Head near Scarborough, the North Riding County Council's adult education centre. Owing to a change of date the foray clashed with the Y.N.U. — Y.N.T. symposium held at York and two or three of our regular members were unable to be present.

Fortunately for a foray of this kind we were not overwhelmed by a plethora of specimens, but a representative collection of genera was brought into the work room. Though the emphasis was on agarics, other genera both of basidiomycetes and ascomycetes were collected and displayed. About half the time was devoted to collecting and the other half to lectures by Dr. Webster, and examination of specimens in the work room. Microscopes and other apparatus brought by Dr. Webster enabled most of the students to study the material and there were enough older members present to help smooth over difficulties which arose. It is to be hoped that the exercise may bring one or two into the mycological fold.

Cloughton Woods as usual provided good collecting but nothing particularly out of the way was gathered. This is one place where *Paxillus atrotomentosus* can generally be found and many large specimens were seen. *Nummularia lutea* was also gathered whilst a single apothecium of *Chlorociboria aeruginascens* was a very late date.

Under the guidance of Mr. G. Simpson, the Forestry Commission's Wild Life Officer, a very enjoyable day was spent in the Black Park and Sutherland areas of the Cropton Forest and we were saved a lot of walking by being able to take the bus through the forest rides. Here quite a number of Boleti were picked up, including *B. felleus* with its pink pores. *Lycoperdon echinatum*, an uncommon puff ball, was also gathered as well as several aggregations of *Collybia cookei*.

Forge Valley was very poor and disappointing, less than a dozen species being recorded and an hour in Hackness Park did not add a lot more.

BOOK REVIEWS

Flora Europaea: Vol. 2, Rosaceae to Umbelliferae edited by T. G. Tutin, V. H. Heywood, N. A. Burges, D. M. Moore, D. H. Valentine, S. M. Walters and D. A. Webb. Pp. xxx + 456 with 5 maps. Cambridge University Press. 1968. £7. 7. 0.

The second part of this major systematic work has been eagerly awaited. Fifty families are covered in the present volume though half of the volume is occupied by the two families Rosaceae and Leguminosae. Probably no volume will raise greater difficulties than this one. How to deal on a continental scale with the apomictic genera *Rubus*, *Rosa*, *Alchemilla* and *Sorbus*, in which the number of taxa which have been described at the level of species is very large (some 2000 in *Rubus* subgenus *Rubus*) poses formidable difficulties. Some sort of compromise scheme was inevitable and the problem has been met in *Rubus fruticosus* by describing 66 'circle-species' which are relatively widespread and distinct and listing after the appropriate one to which they are most nearly allied, the names, places of publication and countries of origin of 374 related species. In *Alchemilla*, in which more than 300 European species have been recognised, descriptions are given of 118 species and 143 more are listed under their nearest related species. The same procedure is followed in *Sorbus* with 18 described and 73 listed species. *Rosa* is, by comparison, a simple genus with 47 species described and no lists of related but undescribed species.

Genera with 50 or more species covered in this volume, apart from those referred to above, are *Astragalus* (133), *Euphorbia* (105), *Trifolium* (99), *Viola* (92), *Potentilla* (75), *Genista* (56), *Vicia* (55) and *Lathyrus* (54). The arrangement follows exactly on the pattern of the first volume and the fact that no modifications have been found necessary is a tribute to the initial care with which the work was planned. The treatment of groups of closely related species as collective species in the main keys to the genera followed by separate keys to the species or subspecies under the appropriate group heading within the body of the generic account is a particularly useful arrangement.

Inevitably there is the usual crop of name changes which is an inseparable accompaniment of any such work. The Rosebay Willow-herb becomes an *Epilobium* again and Dogwood and Dwarf Cornel revert once more to *Cornus sanguinea* and *C. suecica*. *Hydrocotyle* is put back again into the Umbelliferae — and by the same editor who took it out a year or two ago in the second edition of Clapham, Tutin and Warburg's *Flora of the British Isles*. *Peplis portula* becomes *Lythrum portula*, the Tamarisk of our south and south-eastern coasts is no longer separated from the continental *Tamarix gallica* and the perennial English flax is demoted to subspecific rank under *Linum perenne*. Species of *Poterium* and *Sanguisorba* are once more reunited within a single genus but the generic name now favoured is *Sanguisorba* and so the Salad Burnet becomes *S. minor* Scop. with the former *Poterium polygamum* treated as a subspecies *muricata* of the same species. The familiar *Agrimonia odorata* is replaced by *A. procera* Wallr., and the Hawthorn known to us for so long as *Crataegus oxyacanthoides* Thuill. becomes *C. laevigata* (Poir.) DC. *Helianthemum nummularium* replaces *H. chamaecistus* as the name for the common Rockrose, *Viola persicifolia* replaces *V. stagnina* and *Euphorbia villosa* is substituted for *E. pilosa*. Any British botanist who fondly imagined therefore that the nomenclature of our own plants had become stabilised with the appearance of Dandy's *List of British Vascular Plants* will be disillusioned. The goal of nomenclatural stability is as elusive as ever; nor can stability ever be more than relative for when taxonomic judgements change nomenclatural changes inevitably follow. But not by any means all or even the majority of the name changes here are due to such causes. The magnitude of the task which has faced the writers must have precluded the laborious research often necessary to solve the more knotty nomenclatural problems. Yet a work of this kind generates an aura of authority and this will tend to confer on its nomenclature a degree of certitude which, one suspects, it may not always deserve.

The work on this volume was completed in February 1967 and the delay of 22 months in its appearance was evidently due to production problems. Let us hope that contributors are now well advanced with their work on the sympetalous Dicotyledons which will form the third volume. Quite apart from the very great merit and utility of its contents this is a beautifully produced book; the sound judgement shown in its planning and the uniformly even and meticulous editing are matched by the fine printing, the good paper, the attractive format and the sturdy binding.

W.A.S.

The Whale, edited by **Dr. Leonard Harrison Matthews**. Pp. 287 with over 100 full-page illustrations, some coloured, and numerous text figures. George Allen & Unwin Ltd. 1969. £5 15s. od.

This is a natural history book of the highest class. It does not deal with the specialised scientific problems such as the physiological adaptations to diving or the curious hearing mechanisms of whales, though there is an interesting introductory account of their method of echo-location, but on the general biology of cetaceans and their unfortunate associations with our own species the whole book is most readable and authoritative. The history of whaling is followed from the earliest times to the present day, with full details of the crafts sailed in and the implements used for capture and disposal of the catch, and the techniques of fishing developed by different peoples in all the seas of the world. Other chapters deal with the distribution, feeding and way of life of whales, the uses to which their products are put and a final chapter on the literature of the subject. Despite the dreadful cruelty involved in all methods of killing whales and the perils and hardships of the calling, whaling remains one of the most romantic of human activities; partly no doubt since it was a gamble, of lives against profit, but partly surely because it tested men to the limit of their powers and in that sense was the ultimate sport. Now it appears to be on the wane and as a salute to its passing, the present book, beautifully produced and illustrated with the most delightful reproductions, photographs and coloured plates, is a worthy tribute. The price is eminently reasonable and this volume would justify a place on any zoologist's shelf and in all school libraries.

T.K.

Modern Biology by **Hans Joachim Bogen**, translated from the German by Harold Oldroyd. Pp. 336 with 182 photographs and figures. Weidenfeld & Nicholson (Educational) Ltd., London. 45/-.

The author tells us that this book has been written '... for a particular kind of person. He is someone who learned biology at school, and still remembers some of it. He reads the more serious daily and weekly periodicals and tries to follow the progress of modern biology from them'. To help him, Professor Bogen provides an account of the state of knowledge of some of the fashionable fields of modern biology, namely molecular genetics, genetics of bacteria and phage, fine structure of cells, gene regulation, immunobiology, and the origin of life, apparently as they stood sometime in 1966. Professor Bogen clearly understands these subjects well. His approach is thorough. Where most authors of a book for laymen scientists would choose simplification, at some cost in strict accuracy, Professor Bogen invariably prefers to sort out the detail. To be fair, he recognises that to read right through his book with understanding will require some effort on the part of his chosen class of reader, but he explains in his postscript why he is glad that it should be so!

This is a well-produced, clearly and elegantly illustrated, basically sound book. It is marred by a limited number of errors, the most obvious of which rather surprisingly occur where the book concerns itself with more traditional and long-established biological fields. Some of the illustrations of mitosis and meiosis are wrongly labelled, the errors evidently arising from a misunderstanding of the nature of metaphase. The division of the plant kingdom (Fig. 173) into algae, mosses, ferns, pteridophytes, phanerogams, and cryptogams is bizarre, to say the least, but is exacerbated by mis-labelling which results in the pteridophytes arising in the Late Carboniferous, and cryptogams in the Jurassic! I have not seen the original, but one suspects that mistakes in translation are the cause of error here. The translation is however very fluent, although occasionally insecure in the high-risk field of terminology. The reviewer himself confesses to a feeling of insecurity aroused by the terms 'codogen' and 'gone', which are new to him. There is some logic in their use, since there are no exact English equivalents, but it is amusing to note that the obvious possibility of confusion between 'gone' and 'gene' is in fact realised by the compositor on p. 93! Certain of the other errors, e.g. typhus for typhoid (p. 134) are simple slips, but the bald statement (p. 197) that 'This method is called oblique vapourisation', when in fact it is usually simply called shadow-casting, and two errors on pp. 72 and 74 which clearly show mis-application of 'nucleolus', confirm one's regret that the publishers did not have the translation of Professor Bogen's worthy book checked by someone more completely familiar with the terminology involved.

J.D.L.

General Biology by **William J. Taylor** and **Richard J. Weber**. Pp. xv + 977, with 456 text figures and tables and one colour plate. Van Nostrand. Second edition, 1968. 105/-.

This is the second edition of a text-book which presents a prodigious amount of factual information, but in spite of the fact that the authors state that it is not a do-it-yourself kit but requires a teacher, it is nevertheless best regarded as a biologist's reference book, for it is stylistically unsuitable for concentrated reading. The problem of presenting facts in an interesting, stimulating and palatable manner must be a major one confronting the authors of text-books. Unfortunately it is also one which is rarely overcome. This book is written in short sentences giving the impression of condensed notes, a process carried, on occasions, almost to the point of confusion. The lack of connecting phrases and the exclusion of associative ideas result in the reader being subjected to an almost indigestible machine-gun-like bombardment of information. However, if the quest is for information it can certainly be satisfied here, and this factor would make the book a most useful addition to the school library.

Plants and animals are dealt with separately and fairly comprehensively. There are three general chapters dealing with living matter, protoplasm and cells, followed by twenty-seven chapters devoted to the plant kingdom in its various aspects. These are in turn followed by twenty-nine on the animal kingdom, and then one chapter each on ecology, genetics and evolution, the whole making quite a weighty volume. There is a considerable glossary which does much to offset the lack of definitions in this terse American text. For example, the Krebs cycle is mentioned several times by name but without any explanation or cross references before it is finally presented in diagrammatic form in the chapter on plant metabolism, the ninth in the book.

Nevertheless, an intelligent sixth former or student, by a judicious use of index and glossary along with the text would certainly emerge a great deal wiser after a session with so much concentrated information not normally presented in text-books of biology. If he should be stimulated to read more widely there is a useful bibliography to point the way. I.W.

An Introduction to Plant Taxonomy by **C. Jeffrey**. Pp. 128 with 8 plates and 20 text-figures. Churchill, 1968. 24/-.

Botanists who are actively interested in systematics ought to be well acquainted with the principles of plant taxonomy. The present book gives a clear account of its basic purposes and workings, the approved methods employed in its practice and the essential rules governing the naming of plants. The approach is simple and straightforward with a minimum of technicalities and designed to be readily intelligible to botanists without any academic background. This is a branch of the subject which often receives scant attention in the teaching of botany and since a proper understanding of basic principles is essential for effective practice, its contents should be familiar to all who are concerned with systematics. W.A.S.

A Fowler's World. An Account of Days on the Marsh and Estuary, by **Ian Niall**. Pp. 163 with numerous line drawings and page decorations by C. F. Tunnicliffe. Heinemann, London. 1968. 35/-.

Chapters devoted to wildfowling tales in marsh, water meadow and estuary are filled with detailed first-hand observation gained from lifelong experience in the field. One might not however completely agree that the Heron is a regular predator on Mallard ducklings, or that, as far as wildfowl are concerned, 'In an hour or so the sound of the gun will have been forgotten'.

Towards the end of the book the author deplores the recent rise in the numbers of irresponsible shooters who lack not only the skill and knowledge to kill a bird properly, but often the ability to recognise it from other species. One hears much to malign the wildfowler in these crowded islands where all those interested in the various aspects of wild bird life must eventually learn to co-exist. This book may play a small part in this process.

Many bird watchers would agree that 'There is always something mysterious about the migrant fowl', but all who are interested in the survival of wild places and the creatures therein would echo the author's hope that 'Responsible fowlers and responsible conservationists will undoubtedly see to it that whatever controls come in the future, they are based on fact and logic and not emotion and mere supposition'. M.D.

The Harewood Park Bird Report. Obtainable from R. V. Jackson, 5 Wensley Grove, Chapel Allerton, Leeds LS7 2NB. 5/- post paid.

Although I learn from the text that this is the fifth such report, it was the first I had seen. Consequently I was surprised to find its title something of a misnomer. Harewood Park birds occupy in fact $9\frac{1}{2}$ pages, while $17\frac{1}{2}$ are devoted to ringing activities of the North Leeds Group over a wide area, their nest record returns, an acrocephalus survey at Swillington, a study of a Blackbird roost at Rufforth, etc.

At the risk of being accused of pedantry I must express the hope that certain points will be remedied in future reports. The persistent use of *its*' (*its*' origin, *its*' activities, *its*' breeding range, etc.) and of *pullus*, where *pulli* is correct, tend to jar. 'Double-brood' as a verb is an unwelcome introduction and to label sheets of water as 'The Main Ing' and 'Little Ings' indicates lack of understanding of the word's meaning.

I may be accused also of reading too much between the lines but must confess to certain misgivings. The ringing of Reed and Sedge Warblers we are told, was done mainly in August and September. Yet over one-third (60 out of 169 Sedge, and 27 out of 82 Reed) were ringed in April, June and July. Breeding birds cannot have benefited. The ringing of young Tree Creepers, Wrens, Tits (? in nest-boxes) and a total of 283 nestling Willow Warblers denotes enormous enthusiasm. Was it entirely judicious? Empty nests (taken as proof of successful fledging?) may rather indicate *premature* departure of the young, or equally their loss to predators whose task of seeking out prey has been made easier. I find it incredible that out of 303 Willow Warblers hatched, 289 reached the free flying stage.

One is led to question how proof could be obtained that the four young Woodcock which hatched did in fact fledge successfully. How could one know that Kingfisher nesting chambers were enlarged and confirm that no eggs were laid in them without at the same time being the possible cause that nesting attempts were abandoned? With such a species in particular, the welfare of the bird must always be the first consideration beside which the amassing of pseudo scientific data is of relative unimportance.

On the other side of the balance sheet, objectives were clearly given considerable forethought; the obvious enthusiasm and effort which went into the year's work are entirely commendable; and it is most satisfactory that a report for 1968 should be already available. Blackbird, Starling and Linnet recoveries of particular interest are reported and there is further evidence for the movements of Canada Geese. The ringing of 616 Blackbirds in one roost in one winter season is a remarkable achievement. To have had 138 'controls', and two overseas recoveries, both in Finland, makes the work even more worthwhile. It is a pity that the interim report on this study has not been submitted to *The Naturalist* in order that it might be more widely read. Other sections also merit inclusion.

R.F.D.

Whitewings: The Life History, Status and Management of the White-winged Dove, edited by Clarence Cottam and James B. Trefethen. Pp. 348 with 61 figures and 2 colour plates. D. Van Nostrand Company Inc. 1968. 70/-.

The White-winged Dove (*Zenaida asiatica*) is an extremely important game bird of the south-western United States, especially in Texas and Arizona. Owing to the shooting pressure to which it is subjected and alterations in its habitat the species has been decreasing since 1945.

This book, the result of some ten years research by the game departments of Texas and Arizona and the U.S. Fish and Wildlife Service, deals with the breeding biology, food, habitat, migration and methods of conservation. It is well written in an expansive style and lavishly illustrated although the reproduction of some of the plates leaves something to be desired.

The species was named Linnaeus in 1758 from a specimen described in George Edwards' *Natural History* published in 1747. This gave the type locality as the East Indies, hence the specific name *asiatica*. In fact the bird is a purely American one and the specimen described by Edwards probably came from Jamaica.

The book gives an insight into the problems facing the conservation movement in the U.S.A. and makes interesting reading. I am afraid, however, many British ornithologists will be deterred by the cost.

P.J.S.

British Names of Birds by **Christine E. Jackson**. Pp. 125. H. F. and G. Witherby. 30/-.

'The bird-watcher will find the book useful to establish species when he hears dialect names being used,' we are told. I doubt very much, however, whether bird-watchers will make much use of it. Dialect names are dying out; and in any case most county avifauna publications already have their own lists, with more detail than can possibly be collected into one volume such as this. Chislett (1952) contains no such list for Yorkshire, but Nelson has already done so comprehensively. He included many local names not reproduced here.

Whether such a book makes confusion less confounded is doubtful when 'Storm-cock' can be Mistlethrush, Greenwoodpecker or Fieldfare, according to locality. It is a pity Miss Jackson does not include one of the last's more expressive names — 'Chucker'. 'Cuddy' is a name which may apply to Wren, Tree Sparrow, Moorhen, Treecreeper or Dunnock. As a village boy in Buckinghamshire, up to about the age of eleven I knew the Dunnock by no other name than 'Tootie', nor the Chaffinch than 'Choddy'. Both were universally used but do not occur in this book. The Long-tailed Tit was 'Bumbarrel', a name which I discover here was also used in Notts.

That the lists of names are far from complete may be the fault of the literature rather than that of the present author but it is regrettable that no bibliography is given and one cannot in consequence be sure which sources have and which have not been consulted.

For the most part, numbers in the index are in Roman type and refer to arbitrary numbering of the list of British names. Despite advice on this point I inevitably found myself using them as page references. These, also, should have been given for all entries in the index. In addition to dialect names, there are sections giving falconers', wildfowlers', bird-fanciers' (-catchers) and swan-keepers' rather specialised vocabularies, as well as poetic, and collective names and terms applied to the young of certain species.

British Names of Birds may have proved an interesting academic exercise but will not, I fear, have a very wide appeal. R.F.D.

Wild Season by **Allan W. Eckert**. Pp. 244, with seven line-drawings by Karl E. Karalus. Gollancz, 1968. 30/-.

The month of May is the wild season and it is the happenings in the world of nature during this one month which are recorded for us here. The scene is set at a lake created by glaciers of the ice-age on the Wisconsin-Illinois borders. The theme is that 'there exists a persistent interdependency of its creatures one upon another. And there is never waste'. Persistently through my mind as I read this book, ran the ditty, 'There was an old woman, who swallowed a fly . . .', except that here it is a bullfrog which is eaten by a largemouth bass. This is caught and gutted by fishermen, the entrails attracting a raccoon which in turn is attacked by a bot- (warble-) fly. A meadowlark eats the warble-fly, emits undigested grain in its faeces thus providing a young shoot of corn as food for a rabbit. So far we are only half way through the story and I must not anticipate your enjoyment by itemising how the snapping turtle, woodland deer-mouse, pine warbler, bull-snake, musk-rat, crows, great horned owl and others fit into the picture.

I think you will already guess that however vividly and imaginatively the life-stories of these creatures are written, they are not based on actual observation, especially as they are ascribed to only sixteen days in the one month of May. The graphic descriptions and inevitability of each creature providing a meal for the next will suit youngsters rather than serious students. R.F.D.

A Contribution to the Ornithology of Zambia by **C. W. Benson** and **M. P. Stuart Irwin**. Pp. xiii + 139. Zambia Museum Papers 1. Published on behalf of the National Museums of Zambia by Oxford University Press. 50/-.

Described as 'an essential preliminary and supplement to a new and greatly revised book on the birds of Zambia which is to be published shortly', this paper is a list of some 240 selected species. It gives details of their distribution based mainly on field-work during 1962-5, especially in the hitherto little-known parts of Western Zambia, particularly Barotseland; discusses certain taxonomic problems and presents more information on breeding seasons.

The Sounds Between by **Roscoe Howells**, foreword by Wynford Vaughan Thomas. Pp. 192, 50 illustrations. Gomerian Press. 40/-.

The islands of Skomer, Skokholm, Ramsey and Grassholm off the west coast of Pembrokeshire have for many years attracted naturalists because of the sea-bird colonies, and the beauty of their scenery. This has tended to distract attention from the people who have tried to make a living by farming, catching rabbits and fishing from the islands. This historical survey rectifies the omission in an interesting and racey way, with particular emphasis on the fluctuating fortunes of island farming. The hard life develops character and individuality in the people who in turn made their mark on the area. Now all these islands are nature reserves and the farm life is almost gone. Mr. Howells' specialised knowledge as an agricultural journalist and a Pembrokeshire man has produced a most valuable local history, which everyone interested in that part of Wales should read. J.D.P.

I'll Trade You an Elk by **Charles A. Goodrum**. Pp. 220. Phoenix House, London, 1968. 30/-.

The author's father, Bernie Goodrum, was Director of Recreation of the city of Wichita, Kansas, and as such had charge of the municipal zoo. This is the story of how the zoo rose from obscurity to a dizzy peak of near greatness and then sank to its former state. It is a marvellous story, full of incident, and can be recommended to the widest public; those who at any stage in their lives have owned an animal and/or worked for a municipal employer, or done both simultaneously, will appreciate this book to the full. The funnier passages will no doubt be anthologized in the future and the whole work should be required reading in Zoological gardens, wildlife parks and Corporation Parks' Departments everywhere. By way of a postscript it may be worth mentioning that the author did not follow in his father's footsteps and also, after Bernie Goodrum's retirement, plans were afoot to restore Wichita zoo to glory — along the lines that Goodrum himself had advocated in his pioneering days.

T.M.C.

A Handbook for Naturalists, edited by **Winwood Reade** and **R. M. Stuttard**. Pp. 160 with numerous illustrations. Evans Bros. 12/6d.

This little paper-back was produced on the recommendation of the Council for Nature's Youth Committee, with the initial aim of helping school leavers in any natural history pursuits. It may also provide a useful source of information for any amateur naturalist, for it deals briefly with a wide variety of topics.

There are ideas for field work, both for individuals and for groups, and notes on the establishment of nature reserves and nature trails. A chapter outlines types of equipment needed and there are useful lists and details of organisations and publications, as well as a general naturalist's bibliography. Another chapter deals with the law and the countryside.

Nearly half the book is devoted to a survey of the animal and plant kingdoms and how they are classified. This part would doubtless prove helpful to those with no academic training, but one wonders whether it might not have been greatly reduced, so that the book could be cheaper, or could have included more detail in the practical notes.

N.V.M.

Birds from the seas, scrubs and swamps of Australia by **Harry Frauca**. Illustrated by Claudy and Harry Frauca. Pp. 122 with 85 plates, 15 in colour. Heine-mann. 50/-.

The title of this book might lead the purchaser to suppose that it is primarily an identification guide, but in fact it is an interesting account of the breeding biology and young of a selection of Australian birds. The species are chosen in various ways, some by nesting sites and some by habitat, giving the book a rather discursive air. The descriptions of the nest construction of the honeyeaters, 'the most Australian of birds', and the scrub turkey (*Alectura lathami*) are of particular interest. The illustrations are profuse and many are in colour. One can recommend this book as supplementary reading to any ornithologist visiting Australia, particularly the state of Queensland.

J.D.P.

The Entomologist's Record

and Journal of Variation

A monthly illustrated magazine, founded by J. W. Tutt in 1890, is devoted mainly to the Lepidoptera of the British Isles. It also deals with other orders of insects especially Coleoptera, Diptera, Hymenoptera, Orthoptera. Its articles include descriptions of new species and varieties, reports on collecting trips, distribution, habits and habitats of insects and of collecting and study techniques suitable for novice and expert. It circulates in 47 countries.

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CHISLETT MEMORIAL LECTURE

The Fifth Chislett Memorial Lecture will be held in Leeds on Saturday, 27th September 1969, at 6.30 p.m. (to follow the afternoon meetings of the Botanical Section). The speaker will be Dr. F. H. Perring, on 'Recording Britain's Wildlife'. Dr. Perring is head of the Biological Records Centre of the Monks Wood Station of the Nature Conservancy. From 1954 to 1962 he worked on the Botanical Society of the British Isles Distribution Maps Scheme, initially as assistant to Dr. Max Walters and then, from 1959, as Director.

The mapping scheme undertaken by the Botanical Society and resulting in the publication of the *Atlas of the British Flora* in 1962 has been the basis for Distribution Mapping Schemes for other groups subsequently, such as butterflies and moths, dragonflies, etc., and the Biological Records Centre also assists with mapping schemes organised by other bodies such as the British Trust for Ornithology's current Ornithological Atlas. Dr. Perring's talk should therefore have a wide appeal for all Y.N.U. Sections.

Y.N.U. NEWSLETTER

The Y.N.U. Newsletter, sent to all Full members and Affiliated Societies, is published three times a year: February, May and November. Its aim is to provide a means of intercommunication between all members by giving, for example, reports on Y.N.U. and Society meetings and activities, items of broad Natural History interest, details of all types of surveys and enquiries. All items should be sent to the Newsletter Editor: Mr. H. T. James, 238 Sigston Road, Beverley, Yorks.

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A CONSERVATIONIST'S APPROACH TO WILDLIFE PROBLEMS

IAN PREST

(Toxic Chemical and Wildlife Division, Monks Wood
Experimental Station, Huntingdon)

Until comparatively recently most problems affecting the conservation of the natural flora and fauna in Britain have arisen as a direct result of local events. Such things as the building of a new factory at the edge of a town on what was previously a common, the felling of a wood, or the draining of a marsh. It is understandable therefore that much of the attention of the County Naturalists' Trusts, which form the basis of the voluntary conservation movement, has been given to trying to anticipate local changes of this type to limit wherever possible the destruction of the countryside and its wildlife. Some recent events have shown that there is now an increasing risk to the flora and fauna as a result of events which took place a considerable distance away, often well outside a county's boundaries. This means that however conscientiously a County Trust may have made provision to safeguard its local flora and fauna, its efforts could be greatly diminished by the occurrence of an incident outside its immediate control, possibly taking place even without its knowledge. One such event, which will be discussed in this paper, is the present use of persistent toxic chemicals. There have been other recent examples, one being the wreck of the oil tanker, *Torrey Canyon*. Oil from this wreck affected the coasts of Cornwall, the Channel Islands, and reached the shores of France. Had the normal prevailing south-westerly winds been blowing, the oil would almost certainly have affected all coastal counties of southern England, possibly even reaching Wales.

Obviously incidents of this kind, with widespread effects, are going to give rise to new problems and we will have to alter our approach to conservation to deal with them. I want to stress three aspects of this situation: (a) the fact that we have now entered an era when large-scale events are much more likely to occur, probably in ever increasing number; (b) to deal with them there will be an increasing need for professionalism in conservation; and (c) it will be necessary to plan ahead and establish a high degree of co-operation between all conservation bodies.

The first aspect, the greater likelihood of large-scale events occurring, is largely a reflection of present day advances in technology. Most events nowadays tend to be of greater magnitude and will thus have a greater impact. Until the last World War it was perfectly possible for the Royal Air Force to test their most powerful high explosive bombs on ranges in Britain, whereas today nuclear devices can only be exploded in a few very remote parts of the globe — even then most countries receive some effect in the form of radio-active fallout.

To consider the specific example of the use of persistent toxic chemicals and their effect on wild birds. Although some of the effects of these on wild birds have been established, research into other possible effects is still in progress. Initially, therefore, I will simply recount a number of changes which have been observed in many bird species in Britain since 1945, and then go on to discuss the possible link of these with chemicals.

From a discovery not made until 1967, we now know that the first incident took place twenty years ago. Ratcliffe (1967), while investigating the current widespread breeding failure in the Peregrine (*Falco peregrinus*), discovered that in the late 1940's the eggshells of this species underwent a marked (19%) decrease in weight, indicating a reduction in the thickness of the shell. This deterioration in shell quality, which has continued to the present day, is undoubtedly an important factor in the breeding failure of this species. We now know that this same phenomenon has affected several other species, including the Golden Eagle (*Aquila chrysaetos*), Sparrow-Hawk (*Accipiter nisus*), Heron (*Ardea cinerea*), Cormorant (*Phalacrocorax carbo*), Shag (*P. aristotelis*) and Carrion Crow (*Corvus corone*) (Ratcliffe in prep, Prest in prep).

The second event, this time all too obvious, was the death of thousands of granivorous birds in the spring in the late 1950's and early 1960's (see Cramp *et al.*, 1962).

The third incident again came to light following work on the Peregrine. As a result of representations made to the Home Office by racing pigeon interests, a national survey of the Peregrine was carried out by the British Trust for Ornithology in 1961 and 1962. Its purpose was to see if the Peregrine had become exceptionally common. The results showed the opposite to be the case. A rapid decline in numbers had begun in about 1955 in southern England and then spread northwards eventually affecting

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Wales, northern England, southern Scotland and parts of the Highlands and Islands. By 1961, two-fifths of the pre-war population had disappeared and only 82 pairs (19 per cent of the territories visited) were known to rear young; in 1962 only half the known territories were occupied and the number of successful pairs had fallen to 68 (13 per cent) (Ratcliffe, 1963).

Following the discovery of the decline in the Peregrine, national surveys were carried out of the other common birds of prey in Britain (Prestd, 1965). These showed that, during the late 1950's and early 1960's, the Sparrow-Hawk had declined throughout Britain and the Kestrel (*Falco tinnunculus*) and Barn-Owl (*Tyto alba*) throughout the eastern half of England. Studies being carried out of the Golden Eagle showed that during the same period there had been a relatively sudden decrease in the breeding success of Eagles in the sheep-country in the Western Highlands of Scotland. Between 1937 and 1960 seventy-two per cent of the pairs present in the study area fledged young, whereas from 1961 to 1963 only twenty-nine per cent fledged young (Lockie and Ratcliffe, 1964). Studies in progress of the Sparrow-Hawk and Heron (Prestd and Bell, in prep.) have shown these species also to be affected by widespread breeding failure.

The main point I want to emphasise, regardless of possible causes, is that in the last twenty years a series of apparently unprecedented events affected certain, mainly predatory, bird species in Britain. In no case was the effect localised or confined to a single county, they occurred without any anticipation by ornithologists or conservationists and, with the exception of the deaths of the granivorous birds, only came to light by chance some considerable time after widespread changes in populations, or marked decreases in breeding success, had already begun.

The first of the persistent organochlorine insecticides (DDT and BHC) came into widespread use in Britain in the late 1940's; more toxic compounds (aldrin, dieldrin and heptachlor) did not appear on any large scale until the late 1950's. The following is an outline of the cases for and against the organochlorine insecticides being the cause of some or all of these events. First, the case for implicating the organochlorine insecticides: it is suggested that because several different species have been simultaneously affected in much the same way, they were exposed to a similar factor; sudden unprecedented changes suggest new unprecedented causes; there is a close correlation in space and time with the change in eggshell weight and the introduction of DDT and BHC and the population declines and the widespread use of aldrin, dieldrin and heptachlor; after certain bans had been imposed between 1962-5 on the use of the last three compounds a recovery was recorded in the population or breeding success of most of the species previously affected; surveys of residues in wild birds showed that species suffering declines were those in which high residues were present; laboratory experiments have demonstrated sub-lethal effects, such as a delay in ovulation; and it has been established in both the laboratory and the field that dieldrin can pass along a food chain from dressed seed, to granivorous mammals and birds, to predators, resulting in the death of raptorial birds or predatory mammals at the end of the food chain.

The case against this is: despite the widespread use of persistent chemicals, the populations of most wild birds (as indicated by the ringing totals and nest record card returns of the British Trust for Ornithology) appear to be all right; the levels present in tissues of birds poisoned in the laboratory are generally much higher than those found in dead wild birds; birds in laboratory experiments appear to be able to tolerate much higher levels than are generally obtained by wild birds; and while some birds of prey probably have declined, or suffered a decrease in breeding success, the data about these are too imprecise to correlate the start of the changes with the introduction of persistent chemicals. Both sides agree that the death of the granivorous birds was undoubtedly as a result of organochlorine poisoning, the birds having consumed an acute dose of the aldrin or dieldrin seed-dressing with the seeds on which they were feeding.

That two such opposite views still exist on this subject is an indication of how intractable a problem of this kind can be, involving as it does aspects of both chemistry and animal physiology and ecology. The difference of opinion is largely a reflection of the difficulties and complexities of the research required and of the commercial value and benefit of the chemical products concerned. When the Government's Advisory Committee on Poisonous Substances used in Agriculture and Food Storage reviewed the persistent organochlorine insecticides (Cook, 1964) they accepted, "that the use of certain of these pesticides has probably been a major factor in the recent decline of some British birds of prey" (pp. 20-21).

Initially, following the introduction of persistent chemicals into agriculture in Britain, considerable ill-feeling was aroused between some conservationists and certain agricultural organisations and sections of the chemical industry. Liaison committees have now been set up and a code of practice agreed. It is important to realise, however, that industry will not lightly accept evidence against its products. Thus Shell Research Ltd., using data obtained in its own laboratories from experiments in which dieldrin has been fed to humans, dogs and birds (cf. Robinson, *et al.*, 1967, and Robinson, 1969), has vigorously promoted a campaign defending the use of dieldrin. They have also subjected the work of the various conservationist bodies to extremely detailed scrutiny and drawn attention to what they consider to be the weaknesses in the evidence, e.g. at the First Rochester Conference on Toxicity, held in June 1968, Rochester (U.S.A.), Dr. J. Robinson of the Shell Tunstall Laboratories devoted a considerable part of a long paper to criticism of much of the work carried out in Britain on birds of prey (Proceedings, in press).

This course of action is not unexpected. It is understandable that the Shell Company should desire to justify the sale of one of its products if its use is subsequently criticised, whatever the source of the criticism. I am not concerned with the merits or otherwise of industry's reactions, the point I want to stress is that the type of large-scale event I have been discussing will most probably have been initiated by a large industrial concern or public body. Such organisations are extremely powerful and can draw on large resources and so are difficult to oppose. Indeed their very size can by itself make the situation confusing. Thus at the same time one department of the Shell Company can be opposing conservationists' requests for the withdrawal of certain chemicals, while another is giving financial support and publicity to Nature Trails.

It is the difficulties that may be encountered in trying to deal with this type of problem that give rise to my second point — the need for increased professionalism in conservation. To illustrate what may be involved, we can consider the time, manpower and expense that has already been devoted to this question of birds and pesticides by part of the Toxic Chemical and Wildlife Division at Monks Wood. The staff involved include 5 qualified scientists (2 population ecologists, 1 toxicologist and 2 chemists), helped by 5 scientific assistants. The team was set up in 1960, but intensive bird work was not started until 1962–3 and the full group was not assembled until 1963. This means that approximately 10 staff have been working on this problem for just over 5 years. The expenses involved per annum including equipment, travel, salaries, and additional chemical analyses completed on our behalf by the Laboratory of the Government Chemist in London, amount to some £30,000. Thus a total of something like £150,000 was spent up to the end of 1968.

The team first submitted evidence to the Government's Advisory Committee in 1961, which led to the voluntary ban on spring-sown seed-corn; further evidence was submitted for the 1964 report of the Advisory Committee, in which further bans on uses of aldrin, dieldrin and heptachlor were recommended, including a ban on dieldrin sheep-dip in 1965; a third submission of data has just been made, including work on DDT, for the current review of the organochlorine compounds being conducted by the Advisory Committee. As I have already pointed out, however, despite all this effort and expense by the Nature Conservancy alone, the problem has still not been completely investigated and it is now over 20 years since a persistent organochlorine insecticide was first introduced into agricultural use in Britain. Britain's contribution to the study of the possible harmful effects of persistent pesticides on wildlife has probably been as considerable as that of any other country and our results have been quoted throughout the world. I submit that without a professional team of trained scientists and considerable financial backing, the progress that has been made (in spite of many difficulties) would have been very considerably less. Possibly to the extent as to have been ineffective against the representations of the agricultural interests. It is not surprising that voluntary bodies such as the Royal Society for the Protection of Birds (R.S.P.B.), the British Trust for Ornithology (B.T.O.) and some of the County Naturalists' Trusts are now employing full-time (i.e. professional staff) including trained scientists. While this trend may not be welcomed by all amateur conservationists, because it almost inevitably alters the organisation of a voluntary body, it would appear to be essential if conservationists are to take a serious part in preserving the natural flora and fauna in the future.

I trust my third point, the need for co-operation, will already be evident from what I have said. This co-operation will be needed between official and amateur bodies, between the various amateur bodies, between sporting interests (such as the

Wild-fowlers' Association of Great Britain and Ireland, the British Falconers' Club) and conservation bodies. An important part of the work on organochlorine insecticides and birds was the national surveys of bird populations. These were an excellent example of co-operation between conservation bodies and their success proved to be an important factor in Britain's lead in the investigation of pesticide/wildlife problems. Derek Ratcliffe, a member of the Nature Conservancy staff, organised the B.T.O.'s national survey of the Peregrine (Ratcliffe *loc. cit.*); I, also a member of the Nature Conservancy staff, organised the B.T.O.'s national survey of the other common birds of prey (Prentt *loc. cit.*) and of the Great Crested Grebe (*Podiceps cristatus*), when it was suspected this species may have been affected by the organochlorine insecticides (Prentt and Mills, 1966). Most of the specimens of dead birds of prey used for autopsy and chemical analysis were found by B.T.O. or R.S.P.B. members and sent to the Monks Wood Experimental Station.

It is obvious, however, that co-operation and planning will be essential in many other aspects of conservation, e.g. it is urgent that as many details as possible are obtained about the present distribution of our flora and fauna, so that if any incidents do occur we can quickly evaluate the extent of the damage. It is also equally important that conservationists everywhere are alert to changes that may be occurring. While a few individual observers had noticed that locally Peregrines appeared to be decreasing, the significance of their observations was not realised. It was several years later, quite fortuitously, that the unprecedented decline in numbers and breeding success of this species came to light. Had the delay in its discovery been any longer, had the nucleus of the Conservancy's Toxic Chemical and Wildlife team not been in existence and had the basis of co-operation between the Nature Conservancy, the R.S.P.B. and the B.T.O. not already been in existence, it is very probable that the Peregrine and possibly the Sparrow-Hawk would now be extinct in Britain.

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A female kestrel, dead but still warm, was found on 2nd March 1969 in open pastureland near to Chomondley Hall, Chomondley, Cheshire. A *post mortem* revealed two short-tailed field voles and the left ramus of common shrew in the distended stomach; the liver was much split with congealed blood everywhere including one clot wedging the base of the trachea for half an inch. Ovulation not evident. Otherwise in prime condition.

ELLEN HAZELWOOD

THE PARASITIC COPEPODS *ACHTHERES PERCARUM* NORDMANN AND *SALMINCOLA GORDONI* GURNEY IN YORKSHIRE

GEOFFREY FRYER

Freshwater Biological Association, Ambleside, Westmorland

Of the two parasitic copepods referred to here, both of which belong to the family Lernaepodidae, *Achtheres percarum* was collected in Britain for the first time in 1954 in the River Colne, and in the Grand Union and Kennet and Avon Canals, all of which are in the Thames drainage area (Harding & Gervers, 1956). Since then it has been reported from Rostherne Mere, Cheshire [Rizvi — unpublished thesis, cited by Chubb (1965)] but not apparently elsewhere in this country. Because of the confusion in which it was involved (see below) it was, however, described and illustrated by Gurney (1933) in his monograph of the British freshwater Copepoda. The material he used came from continental Europe. The other species, *Salmincola gordonii*, was already known in Yorkshire and was indeed described from specimens collected in the River Rye (Gurney, 1933). It has since been reported from Scotland (Friend, 1939) where it had already been found prior to Gurney's work but had been erroneously reported (Scott & Scott, 1913) as *Achtheres percarum*, and has more recently been reported from the Isle of Man (Bruce, Colman & Jones, 1963). Outside the British Isles it is unknown. (It is possible that *S. heintzi* (Neresheimer) from Bavaria, which I regard as unrecognisable from existing descriptions, is closely related to this species.)

Material of *A. percarum* (Fig. 1) has now been obtained from three localities in Yorkshire, where it has evidently been established for some time as some of the specimens were collected as long ago as 1958. The two earliest collections came to me via Mr. A. Rennie of the Yorkshire Ouse and Hull River Authority and consisted of three specimens taken from a Perch (*Perca fluviatilis* L.) in Doe Park Reservoir, near Denholme (Nat. Grid. Ref. SE 077340) in June 1958, and several individuals taken from four Perch in the Lower Lake, Bretton Park (Nat. Grid. Ref. SE 285125) in August 1961. The overflow of Doe Park Reservoir goes to Harden Beck which joins the River Aire at Bingley. Bretton Park Lake lies between Clayton West and West Bretton and its overflow goes to the River Dearne, which joins the Don at Denaby, near Mexborough. The third locality is Lower Dunsforth (Nat. Grid. Ref. SE 450645) where three specimens were taken from two Perch in the River Ouse by Mr. C. Milner in July 1966 and came to me via Mr. E. W. Aubrook. All the material from these three localities consisted entirely of females.

No information is available concerning the site of attachment of the specimens in the first two localities, though the buccal cavity is the most usual, and all those from the Ouse were so located and gave rise to considerable inflammation. In all, 33 parasites were obtained from four fishes at Bretton Park, and the sample of fishes examined included one Perch which was apparently uninfected.

Like many highly modified crustacean parasites, *A. percarum* exhibits considerable variability of those parts of the body which are not concerned with functions such as attachment and feeding. This was illustrated by the material in the present collections which showed both inter- and intra-population differences. Many of the specimens from Bretton Park were particularly squat and fat. Such an individual is shown in Fig. 1a, which gives a general impression of the size and form of the animal and supplements Gurney's figures which are of more slender individuals.

Particularly noteworthy as it seems not to have been referred to before, was the variation in length of the maxillary arms (Mx). Distally these jointly give rise to a single median bulla (B) (see particularly Fig. 1, e and f) which is inserted into the host (Fig. 1, c and d). In some individuals the maxillary arms were very short and scarcely extended beyond the limits of the cephalothorax (Fig. 1, c): in others they were very long (Fig. 1, b and e), being considerably more than twice as long as the shortest in animals of approximately the same size, and extended far beyond the limits of the cephalothorax. Between these extremes were arms of various intermediate lengths. All the available specimens had been removed from the host so the exact site at which each was attached was not determined, but one suspects that this variation is of functional significance and that it will prove to be related to the position in which the parasite establishes itself.

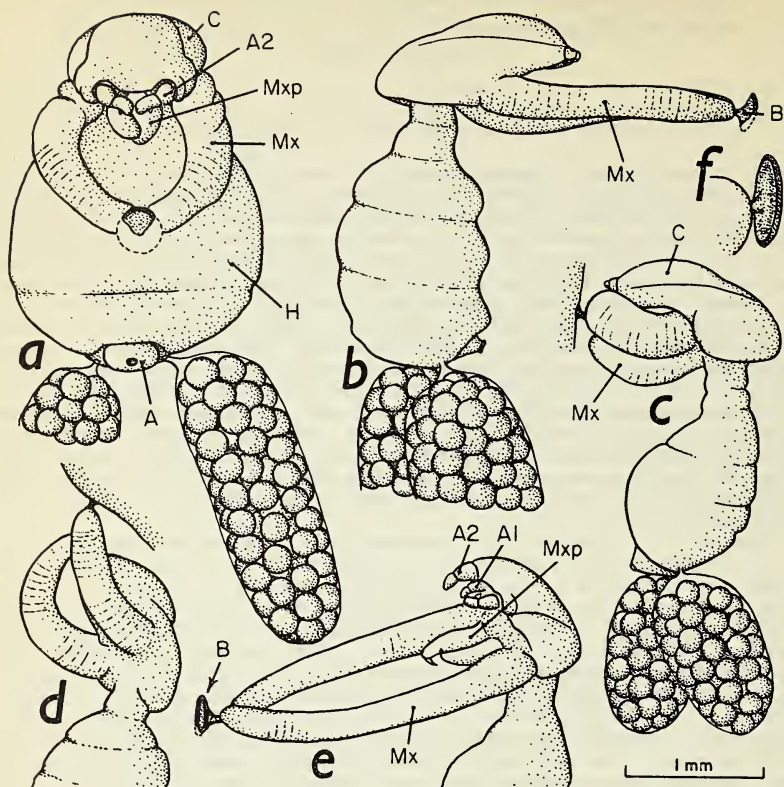


Fig. 1. *Achtheres percarum*.

a: Adult female ventral. b: Adult female lateral. Note the very long maxillary arms of this individual. c: An adult female, lateral, showing the way in which the bulla is inserted in the host. Note the very short maxillary arms of this individual. d: Another female with the bulla still in position in the host showing, in comparison with Fig. c, how the orientation of the maxillary arms differs in different individuals. e: Another female, seen ventro-laterally to reveal some of the appendages. Note the very long maxillary arms of this individual. f: The bulla.

Note: All specimens illustrated are from Bretton Park Lake.

Legend: A1: Antennule. A2: Antenna. Mx: Maxilla. Mxp: Maxilliped.

B: Bulla. C: Cephalothorax. H: Hindbody. A: Abdomen.

There is also apparently a considerable variation in size. Gurney (1933) gives the length of females as about 4 mm., Wagler (1937) as 4-5 mm., and Gusev (1962) as 3-5 mm. Most of the Bretton Park specimens, however, were only about 2.5 mm. in length, but two of the three specimens from the Ouse had a length of about 3 mm.

Some of the eggs of a specimen from the Ouse contained larvae which were beginning to emerge. These are copepodid larvae, for all naupliar stages are passed through in the egg.

Salmincola gordonii (Fig. 2) is known as a parasite of the Brown Trout, *Salmo trutta* L. and Grayling, *Thymallus vulgaris* (Nilsson) in the River Rye (erroneously called Ray in the original description) and from the Brown Trout in Scotland. It is also recorded from *Salmo trutta* in Port Erin Bay, Isle of Man, having been found there in

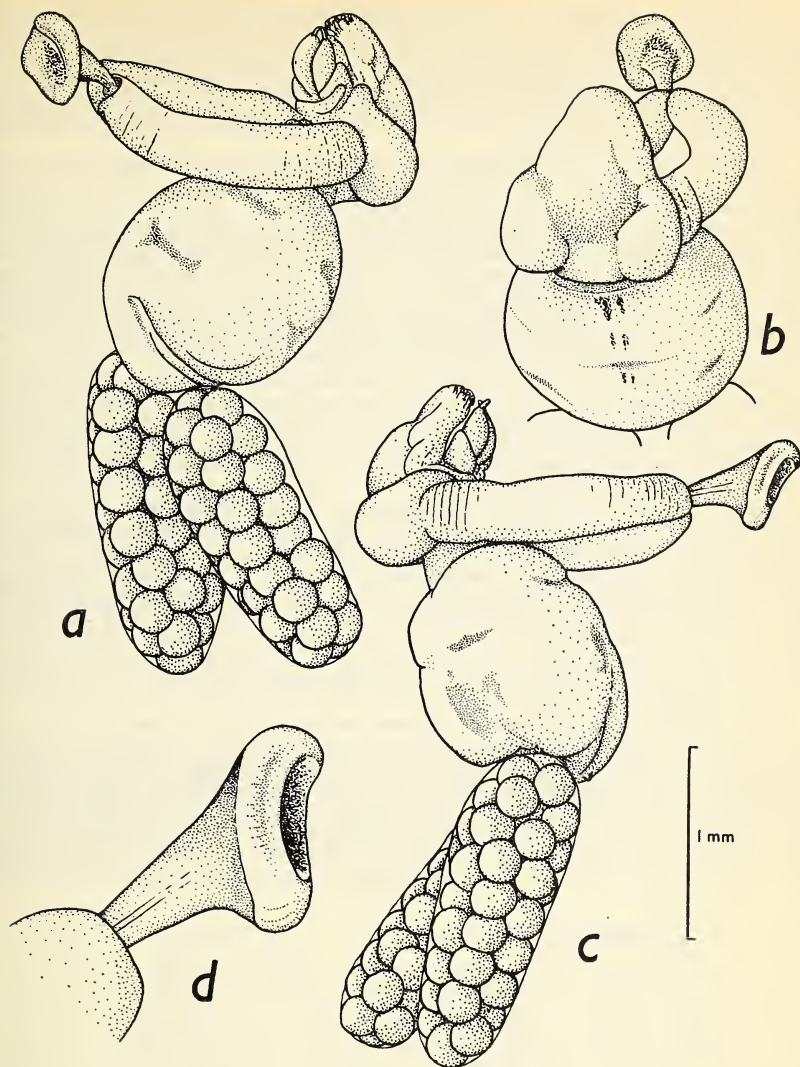


Fig. 2. *Salmincola gordonii*.

a: Adult female, lateral, from the left. b: The same, dorsal.
c: The same, lateral, from the right. d: The bulla.

1956 and 1958 (Bruce *et al.*, 1963). These individuals were presumably living on Sea Trout. Unless physiological races of this parasite exist, it would therefore appear that, like its close relative *S. salmonea* (L.), a parasite of the Salmon, *Salmo salar* L., and like its salmonid hosts, it is markedly euryhaline. Although some populations, such as those established on Brown Trout in regions far from the sea — such as the River Rye — are obviously permanently established in freshwater, these are undoubtedly of marine ancestry and presumably became permanent inhabitants of freshwater in post-glacial times.

I have seen a specimen of *S. gordonii* collected on Trout in the type locality in 1960 by Mr. A. Storey, and can now add two further localities, both in Yorkshire. One of these, the River Swale at Richmond, where a single specimen was taken by Mr. M. Ll. Parry from under the operculum of a Brown Trout, is not entirely surprising for both Rye and Swale ultimately join the Ouse. The other record appears distinctly puzzling at present, but this may be due merely to our ignorance of the habits and abilities of *S. gordonii*.

Among the parasites taken from Perch in Bretton Park Lake one was picked out as being different from the rest, and subsequent dissection and examination of its cephalic appendages showed that it was undoubtedly *S. gordonii*. In view of the fact that this species is otherwise known only as a parasite of salmonid fishes, its occurrence on Perch, which belongs to an entirely different family is surprising. However, as all the parasites were collected at the same time and place from only four host fishes, and as no-one could confuse a Perch with a Trout, the provenance of the host of this individual cannot be doubted. That it should co-exist with *A. percarum* when so few localities of either are known is also surprising and could perhaps indicate that these parasites are more widely distributed than is at present realised.

What seems possible is that Trout in the lake are infected with *S. gordonii* and that, although this appears to be unusual from what we know at present, the parasite is capable of attaching itself to and reaching maturity on the Perch. The specimen in question was an egg-bearing female. Preparation of this note was delayed for some time in the hope that further material might be forthcoming from Bretton Park, but this hope has not yet materialised.

In spite of their allocation to different genera these two parasites are similar in certain respects, and have been confused in the past. Indeed, as yet undescribed species may have been involved in the confusion in Scotland (Friend, 1939). The two can, however, be separated by unambiguous differences in the cephalic appendages and, on gross examination, by the absence of clear signs of segmentation of the hind body of *S. gordonii* (compared with distinct signs in *A. percarum*), and by distinct differences in the shape of the cephalothorax, that of *S. gordonii* being distinctly triangular when viewed dorsally (Fig. 2, b; Fig. 3, b) while that of *A. percarum* is more or less rectangular (Fig. 3, a). In specimens with an intact bulla, separation presents no difficulty (cf. Figs. 1, f and 2, d).

The addition of *A. percarum* to the fauna of the Yorkshire Ouse system brings to four the total number of lernaepodid copepods now known to parasitise its fishes. In addition to the two species discussed here, *Salmincola thymalli* (Kessler) is recorded as a parasite of the Grayling in the River Rye (Gurney, 1933), where it still occurs, and *Trachehastes polycolpus* Nordmann has been found in several places as a parasite of the Dace, *Leuciscus leuciscus* (L.) and Chub, *Squalius cephalus* (L.) (Aubrook & Fryer, 1965). Of these *A. percarum* and *Trachehastes polycolpus* are probably comparatively recent introductions to the British fauna though it is just possible that the former has

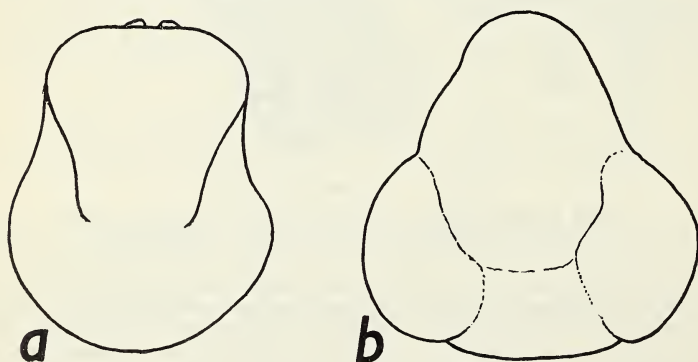


Fig. 3. Outlines of the cephalothorax of — a: *Achtheres percarum* and b: *Salmincola gordonii*, from above.

long been present in Britain but has escaped detection. A further species which may be added to the lernaepodid fauna of the Ouse if search be made for it is *S. salmonea* (L.) which parasitises the Salmon and Sea Trout. Material of this or any other parasitic crustaceans would be much appreciated should it be collected by anglers or others.

I am grateful to Messrs. A. Rennie and E. W. Aubrook who placed most of the material studied at my disposal.

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NATIONAL BADGER SURVEY 1969

R. J. PAGET AND A. L. V. MIDDLETON

The *Naturalist* (Jan. 1968, 27) includes a short article contributed by one of us on the National Badger Survey. We feel it is now worthwhile to state the present position regarding badger setts in the West and East Ridings.

There are 122 setts now known in the West Riding and 67 in the East Riding and their characteristics of habitat and soil are as follows:

TABLE I

HABITAT	WEST RIDING	EAST RIDING
Deciduous Wood	53 (43.5%)	22 (32.8%)
Coniferous Wood	6 (5.0%)	11 (16.4%)
Copse	10 (8.2%)	2 (3.0%)
Hedgerow	14 (11.4%)	7 (10.5%)
Open field	13 (10.6%)	18 (26.9%)
Quarry	4 (3.3%)	5 (7.5%)
Moorland	9 (7.3%)	0 —
Others	13 (10.6%)	2 (3.0%)
SOIL	WEST RIDING	EAST RIDING
Clay	73 (59.9%)	2 (3.0%)
Sand	21 (17.1%)	24 (35.8%)
Shale	10 (8.2%)	0 —
Limestone	3 (2.4%)	0 —
	11 (9.0%)	0 —
Coal	2 (1.7%)	0 —
Peat	2 (1.7%)	0 —
Chalk	0 —	41 (61.2%)

The thirteen "others" in the West Riding are of interest and include three on railway banks, three on roadsides, five in riverbanks and two in the embankment of artificial waterways in the fenland around Goole (the only slopes in the area) and the two "others" in the East Riding are, one on an artificial waterway and one on a river-bank.

Of the 122 setts in the West Riding, 98 are occupied (80.3%) and 24 unoccupied (19.7%), comparing with 36 (53.7%) and 31 (46.3%) respectively in the East Riding.

An analysis of sett size is of interest, but it is difficult to assess the true size and the number of holes does not necessarily reflect the number of badgers in residence, since we have both seen a large number of badgers emerge from a "small" sett and a comparative few badgers from a "large" sett. In fact, we have the impression that human interference in the form of stopping, digging and gassing encourages the badgers in a given sett to open up further holes. There are many other factors in addition to interference which lead to an increased number of holes, such as local geology, sett age and site, etc.

A comparison of sett size is shown in Table 2.

TABLE 2

	WEST RIDING	EAST RIDING
Small (3 holes or less)	76 (62.3%)	21 (31.4%)
Medium (3 to 10 holes)	43 (35.2%)	36 (53.7%)
Large (10 or more holes)	3 (2.5%)	10 (14.9%)

Slope is a further parameter usually discussed in the study of setts and of the West Riding setts, 94 (77%) are on a slope, and of the East Riding setts 62 (92.5%). The remaining five East Riding setts on the flat are all in sand.

We thought a further point of interest would be an analysis of the woodland setts, into those on the wood edge (i.e. within 25 yards) and those deeper in the wood. (Table 3.)

TABLE 3

	WEST RIDING	EAST RIDING
On wood edge or in copse	45 (36.9%)	26 (38.8%)
Deeper in wood	22 (18.1%)	9 (13.4%)
Outside woods	55 (45.0%)	32 (47.8%)

We are still unable to comment on the distribution of the badgers in the Ridings since the badger density as recorded reflects more the locality of the recorders than the actual state of affairs as it probably exists. Large areas are still, sadly, without a single record and other areas obviously rich in badgers are represented by but a few records. The greatest numbers of setts at present are in the southern parishes of the county, some around Huddersfield (mainly due to the efforts of W. Stoney), and a few near Ripon (E. Kemp) and a few near Keighley (E. Ginz) and in the East Riding on the North Wolds.

More help is needed and it is hoped that any naturalist reading this article, knowing of a sett or setts, will contact the appropriate recorder concerned so that further progress may be made. Any reports of setts will be most gratefully used (and kept confidential if so required). We will gladly send guide sheets to aid recording to anyone interested in taking part or will call to see a sett by arrangement.

Mrs. S. Bell is at present analysing the North Riding setts. Having only recently taken on the post of recorder her report is not yet to hand, but she too would like to hear of further setts.

The Recorders concerned are: West Riding: R. J. Paget, Glebe Farm, Harthill, near Sheffield. East Riding: A. L. V. Middleton, Lund Farm, Lund, near Driffild, Yorks, E.R. North Riding: Mrs. S. Bell, 18 Rosedale Crescent, Guisborough.

A CENTURY OF BIRD PROTECTION

R. F. DICKENS

The first Act of Parliament for protecting wild birds (The Seabirds Preservation Act) was passed in 1869. At last year's joint Y.N.U.-Y.N.T. Conference at York University, E. M. Nicholson suggested that it would be appropriate to celebrate the centenary of the event by arranging a cruise to view the sea-bird cliffs at Bempton and Flamborough. It was the wholesale slaughter of the birds there which had inspired this first measure of bird protection. I am glad to say that the Ornithological Section of the Union readily took up the suggestion and great credit is due to Athol Wallis for carrying through the arrangements for the Centenary Cruise, from Scarborough on 8th June, 1969.

It is perhaps appropriate to recall at this time, that the start on bird protection legislation was made as a direct result of the efforts of Yorkshire naturalists. Regrettably the Union's minutes for the years 1866 to 1870 (or at least those for the West Riding Consolidated Naturalists as it was then called) are nothing more than dates, times and places of meetings. We have to look elsewhere for information about the significant moves during this period to protect birds.

How many present members of the Y.N.U. know, I wonder, that there is a tablet in the south wall of Priory Church, Bridlington, to the memory of "... *Henry Frederick Barnes-Lawrence, M.A., C.M.Z.S., Vicar of Bridlington 1849-1874; Rector of Birkin 1874-1893, ... In 1868 he founded the Association for the Protection of Sea-birds and secured the enactment of close-times throughout the British Isles ...*"

Starting from this clue, and looking through the Annals of Bridlington for the period, I find a reference for 17th October, 1868, to a letter in *The Times* from Rev. F. O. Morris saying that "a movement has been commenced in the East Riding for obtaining an Act of Parliament to stop the destruction of harmless gulls during the breeding season". Kittiwakes were the chief victims at Flamborough and Bempton of course, but it is clear from a later reference that the term "gulls" is used more or less as we would use "sea-birds".

In *Land and Water* about the same time a Commander Knocker says, "An Association has been formed at Bridlington to protect birds on British coasts during the breeding season". Among those supporting the Association were Mr. Walter Strickland, owner of Flamborough; Lord Londesborough, owner of Speeton; the Archbishop of York; Mr. C. Sykes, M.P.; Mr. W. H. H. Broadley, M.P.; the Hon. Admiral Duncombe; Lord Hotham; Col. Akroyd, M.P. and others. The secretaries were Rev. H. F. Barnes and Mr. T. Harland. When and why the former changed his name to Barnes-Lawrence I do not know. A list of rectors of Priory Church gives the name Barnes, as here. But the tablet to his memory bears the name Barnes-Lawrence and it was as Barnes-Lawrence that he was referred to at the Y.N.U. Annual Meeting of 1896 (see *The Naturalist*, No. 893 (April-June 1965), p. 38).

The Sea-birds Preservation Act of 1869, introduced into Parliament by Mr. Christopher Sykes, followed very quickly on the founding of the Association.

With all due respects to Barnes-Lawrence, I suspect that Rev. F. O. Morris was just as enthusiastic and energetic in 1868, in promoting the Association for the Protection of Sea-birds. He was certainly the more assiduous in his keeping of records of bird observations (see Nelson, *The Birds of Yorkshire*). From his letters to *The Times* it would seem that Morris may well have been the driving force. With this in mind, I followed the further lead to Nunburnholme Church, where "Francis Orpen Morris, B.A., formerly of Worcester College, Oxford" was rector from 1854-93. The tablet recording these facts also tells that the tower of the church was built to his memory in 1903 by his son who followed as rector. A tiny cross in the churchward marks the spot where F. O. Morris is buried close to the rectory which must have been a wonderful spot from which to watch birds for close on forty years.

As for Henry Frederick Barnes (or should we say Barnes-Lawrence) had he been alive still when I visited Bridlington Priory on 17th May, 1969, he would have been delighted by the Spotted Flycatchers and Collared Doves in the churchyard, the Swallow hawking over the green outside and by the Dunnocks nesting in the rambler rose on the Priory wall. Or, since he moved from Bridlington to Birkin, perhaps his pleasure would have been the greater, since Birkin is becoming a place more and more attractive to birds and bird-watchers alike. There would surely have been a sense of satisfaction too in the knowledge that his efforts of 1868-9 have been recognised and celebrated by the Centenary Cruise.

I hope that some local member of the Union may have the opportunity to delve further into the history of Bridlington's contribution to bird protection and record it more fully.

FIELD NOTES

Slavonian Grebe and Red-necked Grebe at Scarborough

As though by special request a Slavonian Grebe appeared in Scarborough harbour on Friday, 21st March 1969 and quite remarkably was joined during that day by a Red-necked Grebe, both birds kindly staying for the whole of the following day when the Vertebrate Section Meeting was being held in the town. Some fifty members of the society had, therefore, their trip to the meeting made doubly worthwhile.

Both birds were in winter plumage, the Slavonian Grebe showing the typical features of a black cap to the head, sharply demarcated just above the eye by the almost pure white of the cheeks and throat. The cap was darker in shade than the back and the flanks buffish, flecked with brown. The beak was dagger-shaped, dark in colour with a tiny pale tip.

The Red-necked Grebe was much browner on the head and the cheeks and throat were also diffused with brown. Seen at the close quarters possible as it swam just below the piers the yellow of the base of the bill, along the edge of the upper mandible and round the base of the lower one was beautifully clear.

The Slavonian showed an interesting way of feeding, as on several occasions it was seen to lower its head just below the surface of the water and to paddle rapidly forward. It also dived for food in the normal manner.

Seen side by side the difference in size of the two species was clearly discernable, but several observers commented that the Red-necked appeared smaller than expected.

A. J. WALLIS

Dipper nesting in pot-hole

On 23rd May 1969, whilst examining a pothole entrance near Horton-in-Ribblesdale, Yorkshire W.R. with Mary Crook, we watched a Dipper (*Clinicus cinclus*) fly from a stream 15 yards from the pothole and down into the hole. Closer examination revealed a nest, about 12 feet down the vertical shaft, attached to the rock face. As the bird left it carried faecal sacs, indicating the presence of young in the nest.

Such a nest-site is unusual, and I know of no other similar case. It is especially interesting in that the young, on leaving the nest, would have to fly directly up for 12 feet or fall nearly 200 feet to the bottom of the pothole.

MALCOLM GREENHALGH

An Oniscormorph Millipede new to Yorkshire

Three specimens of the rare little millipede *Geoglomeris jurassica* Verhoeff were obtained from a soil core taken in Bramham Park near Wetherby in December last year. The site is one of the few existing areas of ungrazed grassland remaining on the Magnesian limestone, with a thick sward of *Brachypodium pinnatum* (L.) Beauv. and other grasses. Two of the specimens were female and one a juvenile.

In Britain the species is known from Wytham Wood, Berkshire, where it occurs sparingly in both woodland and grassland. It was first found by Prof. Overgaard Nielsen (who recognised it as new to the British fauna) and Mr. Charles Elton in material collected from a site very similar to that at Bramham Park, and was identified by J. Gordon Blower (Some new and little-known British Millipedes. *Ann. Mag. nat. Hist.*, Ser. 12, 10: 497-508, 1957). It has since been found at Wytham in beech litter from two sites. It has also occurred in beech litter taken from Howe Wood, near Watlington, Oxon., by Dr. Kitty Paviour-Smith in March 1966, and there are other unpublished records for the Merlewood area of North Lancashire. Abroad it is only known from a handful of sites on the Jurassic limestone in the Jura district of Germany.

Males are unknown and the species appears to be parthenogenetic. It is small, unpigmented and blind, living well down in the soil, so that it is not likely to be found except by special search. It has no doubt been overlooked and its distribution may be fairly wide on limestone and chalk in this country.

I should like to thank the Hon. Mrs. Lane Fox for permission to take samples in Bramham Park, and Smiths Gore for their assistance.

S. L. SUTTON,

Department of Zoology, University of Leeds

THE BIOLOGY OF 'OLD DEN' IN THE HUMBER ESTUARY

P. R. MORGAN

The pebble shoal known as Old Den has always been associated with the peninsula of Spurn. Old Den took up its present site in 1610 from material washed through a breach of Spurn, and in the following 50 years grew in size to become an island with sand dunes and vegetation. During the next century the beheaded Spurn regained over a mile in length and began to overlap the site of Old Den. This had the effect of cutting off the material supply of Old Den which ceased to be an island and became a shoal (submerged bank) of smaller size. Spurn was breached again in 1849 and the washings were once again deposited on Old Den which increased in size, but remained a shoal. On this occasion the breach was filled artificially with chalk and the present site of Old Den has changed little since that time. It lies about half a mile off Spurn in the muddy Kilnsea Bay: it is totally immersed at high tide and only fully uncovered at low water levels of spring tide, when it has a length of 1,500 yards.

To a casual observer Old Den gives the impression of being a mere pile of pebbles rising from the midst of an extensive mudflat, a convenient spot, perhaps, from which fishermen may cast their lines, but little else. On close inspection, however, many animal species are to be seen on Old Den and it is in fact an area of great biological interest. At the present time the pebbles are liberally covered with barnacles (*Balanus balanoides*), and this forms the food of the common dogwhelk (*Nucella lapillus*), which is very common. The periwinkle, *Littorina littorea* which feeds on the algal coating of the pebbles is abundant. Edible cockles and mussels are also present but in much smaller numbers; these may also form the food of *Nucella*. Many delicate marine animals are present on the undersides of pebbles and need some seeking out; I have seen several coelenterates (*Plumularia*, *Actinia*, and *Sagartia*) at a low water level, and often polychaete worms live in the gravelly mud between the pebbles (*Nereis*, *Phyllodoce*, *Arenicola*). Living chitons (*Lepidochitona cinereus*), flat periwinkles (*Littorina littoralis*), limpets (*Patella vulgata*), buckies (*Buccinum undatum*), gapers (*Mya truncata*) and Baltic tellines (*Macoma balthica*) have also been found there, but in very small numbers. *Balanus balanoides* is not the only barnacle to have settled on Old Den. The sublittoral *Balanus crenatus* occurs at low water and the rare *Elminius modestus* settled briefly in 1965, but in competition with *B. balanoides* it was not long lived. Old Den does not drain completely when the tide recedes and many pools remain, which contain crustaceans. The shore crab, *Carcinus*, and the tiny pea crab, *Pinnotheres* are easy to find in the summer, and I have also seen the hermit crab, *Eupagurus bernhardus*; if one's eye is quick enough it is also possible to detect the shrimp (*Crangon vulgaris*) and the sandhopper (*Gammarus locusta*). The stream called 'Greedy Gut' which flows between the Old Den and the shore also harbours young fish; young dab, plaice and sometimes eel are to be seen there, and some fishermen set up fixed nets to catch them for food. The fish and molluscs in this area attract several species of predatory bird and these include the common and black backed gull and the oyster catcher.

My own studies on Old Den were centred on the small dogwhelk *Nucella lapillus*. *Nucella* is a small marine gastropod, commonly found on rocky-shores where it feeds on barnacles and mussels. *Nucella* feeds by drilling holes in its prey (mussels) with a ribbon-like tooth about half an inch long called a radula: this is housed within a fleshy manoeuvrable trunk-like organ called a proboscis. The radula apparatus not only drills the shells of its prey but also extracts the flesh from them. *Nucella* may take two to three days to drill a 1 mm. hole in the shell of a mussel and extract its flesh. Barnacles are not opened in this way but usually broken with the large fleshy foot: the meat is taken up through the proboscis. *Nucella* is such an efficient predator that on the open shore it may regulate the abundance of the barnacles and mussels on which it feeds and has been known to wipe out complete populations of its prey. Clearly there comes a point where over-active predation causes severe reductions in food supply and there is usually a balance between the numbers of prey and numbers of predators. On Old Den *Nucella* has been influential in controlling the numbers of several other animal species and there can be no doubt of its biological importance in this habitat.

Old Den provides rather an unusual ecological niche for *Nucella* for it rarely populates areas which are silted or gravelly, and its existence there is of great interest. *Nucella* takes on a remarkable mud-coloured camouflage on Old Den which serves to protect it from the predation of the gulls, and also, incidentally, from the eyes of human visitors. It has developed the extremely rare habit of feeding on cockles which it seeks

over great distances and in the last four years has adjusted its behaviour and physiology several times to adapt to the ever-changing ecological conditions at Spurn.

Nucella was abundant on Old Den twelve years ago and lived alongside extensive populations of *Balanus* and *Littorina*. At this time the whelks presumably fed on barnacles — they exhibit little taste for winkles. In 1955 the North Eastern Sea Fisheries Committee planted a consignment of 15 cwt. of mussels on Old Den to test its potential as an area for growing mussels. These mussels did not survive, partly because of the muddy conditions and partly because of the predation by *Nucella*. Evidence of the activity of *Nucella* still remains in the form of shell gravel deposited on Old Den; the many mussels shells in this gravel were no doubt derived from the consignment and show signs of drilling. With so much food available, *Nucella* fed and multiplied and a large population must have existed in the late 1950's. It is not certain when the mussels were finally exterminated but by 1961 *Balanus* served *Nucella* as food again as it had done before the mussel implantation. There is good evidence that large populations of barnacles have existed on Old Den for many years and this organism probably represents the most stable food supply of *Nucella* in this unstable locality.

Large numbers of intertidal animals were killed all round the British Isles by the severe winter of 1962/63, and the Humber Estuary was no exception. Ice on the Humber scoured barnacles off Old Den during this winter and the few that remained at a low water position were covered with mud and thus killed in the winter of 1963/64. *Nucella* and *Littorina* were able to survive these conditions with greater success because they sought protection between the pebbles. Thus in the summer of 1964 the Old Den presented no obvious food for *Nucella*; *Balanus* and *Mytilus* (common mussel) had been wiped out, and for some unexplainable reason *Nucella* showed no interest in the abundant *Littorina*. The only other possible prey for *Nucella* was *Cardium edule*, the common cockle, washed on to the bank from the surrounding flats in tidal currents. *Nucella* rarely feeds on *Cardium* in nature because the cockle inhabits sandy or muddy places. The two species were able to co-exist on Old Den because it provided pebbles solid enough for the attachment of *Nucella*, together with mud and fine gravel into which *Cardium* could burrow. Although each cockle provided a very large meal, cockles on the Old Den were few and far between. *Nucella* were forced not only to recognise the new prey, but also to detect it, search for it, often over considerable distances and then to locate and attack it with efficiency. This involved a new approach to hunting, for previously *Nucella* feeding on barnacles literally sat on their prey; there was no need for an elaborate chemosensory mechanism for detecting prey from a distance, nor did the habit of preying on barnacles demand large feeding excursions or indeed the behaviour of drilling. Thus the survival of *Nucella* in these somewhat hostile conditions necessitated a considerable change in its habits. The population of *Nucella* survived because they accomplished these dramatic changes in behaviour.

In May 1965 a new population of barnacles settled over a limited area of the shoal which had been bare in 1964. *Nucella* in this area were themselves labelled with *Balanus* and began to feed on the new source of food because it was readily available. Within a few months the population of *Nucella* began to drift towards the new barnacle supply; the density per square meter increased in the barnacle-covered area and decreased in the area where *Nucella* still fed on cockles. The population of barnacles suffered a heavy mortality in 1965 as a result of predation by *Nucella*. In the following year (1966) a new settlement of barnacles occurred. This population extended far beyond the limits of the settlement of the previous year and enhanced the food supply for *Nucella*. Further settlements of barnacles occurred in 1967 and 1968, each extending the limits of the previous year. During 1965 and 1966 considerable numbers of *Nucella* still fed on *Cardium*, but while, on the one hand, barnacles extended, on the other, *Nucella* migrated into them, encountering more favourable feeding conditions. Fewer relied on *Cardium* and more fed on *Balanus* and the whelk population multiplied. At the moment (October 1968) it is difficult to find *Nucella* feeding on *Cardium*, but if severe conditions re-occur, *Nucella* must once again change its feeding habits to survive.

In experiments undertaken in the seawater aquarium at Hull University, *Nucella* accustomed to feeding on cockles exhibited behavioural patterns quite distinct from those feeding on barnacles: they were more active in their feeding habits and took larger numbers of barnacles, mussels and cockles than those previously fed on barnacles. Clearly *Nucella* living in conditions of food scarcity might have been expected to behave in this manner, but they showed no interest in winkles either in

the field or in the laboratory. This is surprising for winkles are the most abundant potential food source for *Nucella* apart from barnacles on Old Den. One possible explanation is the hardness of the shell, and the relative speed of locomotion of *Littorina* as compared with the other victims of *Nucella*. *Nucella* feeding on cockles in nature were also more efficient at drilling holes in their victims than those previously fed on barnacles. Clearly they had gained experience of rasping under natural conditions when dealing with *Cardium*, whereas those fed on barnacles had no such experience. Experiments in the laboratory were conducted on the efficiency of drilling *Mytilus*, and at least one important finding resulted: *Nucella* previously fed on barnacles and therefore unaccustomed to drilling became as efficient at drilling *Mytilus* as those previously fed on *Cardium* after a period of 70 days experience. At the beginning of the experiment experienced *Nucella* took 3.46 days to drill and consume *Mytilus*; those inexperienced took 5 days. After 70 days, experienced *Nucella* took 2.85 days to drill and consume a mussel; those with experience from the experiment 2.28 days. This is indicative of 'learning', although more critical experiments would be necessary to establish this. It is best described as a behavioural adaptation. In a similar way *Nucella* previously fed on cockles became more efficient at dealing with barnacles after a few weeks experience in the laboratory. These experiments reveal the comparative rapidity with which *Nucella* can adjust its feeding habits to suit the food which is available.

Another laboratory experiment involved the choice of food by *Nucella*. *Nucella* previously fed on cockles on Old Den took them readily in the laboratory, whereas those fed on barnacles exhibited practically no interest in them. This result suggests in itself that cockles formed the food on which *Nucella* relied in the absence of barnacles. Exactly why the barnacle-fed *Nucella* did not at first feed on *Cardium* is not easy to explain. Clearly they did not recognise *Cardium* as food, and it is possible that the chemoreceptive mechanism was not adapted to respond to the substances released from cockles, whereas *Cardium*-fed *Nucella* had been conditioned in nature to respond to these substances. Curiously however all whelks, whether fed on barnacles or cockles on Old Den preferred mussels in laboratory conditions even although, at that time, mussels were not available for *Nucella* in the field. The explanation of this result is obscure and needs further investigation.

Previous to this discovery very little was known of the relationship between *Nucella* and *Cardium*. *Nucella* had been observed feeding on cockles in Lough Ine (Ireland) and in the River Crouch (Essex), but the behaviour had never been studied in detail. The predatory behaviour of *Nucella* was studied closely under laboratory conditions with a time lapse cine camera. These films showed that normally only one whelk in a sample of twenty or more actually drilled the cockle. This animal was termed a 'pioneer' and drilled through the shell in about 4 days. As soon as the 'pioneer' had penetrated the prey the cockle opened and the damaged tissue released body substances in higher concentrations than before, attracting many more individuals. These 'exploiters' took the flesh from between the valves of the prey whereas the 'pioneer' took the flesh through the site of its own boring. As many as 17 'exploiters' and one 'pioneer' have been seen feeding on a cockle on Old Den and on one occasion in the laboratory 36 animals were seen feeding on a single cockle. The method the 'pioneer' uses to seek its prey is of great interest. In still water *Nucella* is attracted to the odours released from *Cardium* and approaches its prey in a series of convoluted paths. This method is relatively inefficient when compared with the trails taken by *Nucella* in a current of water. In a current, *Nucella* orientates its body and moves directly upstream; if the locomotion is released by the chemoreception of cockle odour, the natural upstream course will lead it directly on to its prey. This current orientation behaviour occurs on the Old Den and explains the efficiency with which *Nucella* locates thinly scattered *Cardium*. Most of the cockles on the Old Den are drilled whilst buried in the substrate: these specimens show perforations in the upper posterior region of the shell close to the siphons. In contrast, cockles drilled in the laboratory on glass-bottomed tanks show perforations all over the shell. This evidence suggests that *Nucella* shows no specificity of boring site in freely exposed *Cardium*, but is forced to drill the uppermost area when it is buried in the substrate.

Clearly the inter-relationships described in this biological story only form part of a much more extensive and elaborate ecosystem on the Old Den. With so few cockles available on the shoal it is certain that *Nucella* competed for food with the gulls and the fishes resident in the same area. In such conditions many *Nucella* must have perished without finding food and others may have become vulnerable to the predation of gulls.

In conditions such as these, over-exploitation of a stock of prey often limits the abundance of predators. In 1965 the population of barnacles was almost annihilated as a result of over-exploitation by *Nucella*. Fortunately barnacles resettled in the following year, and the food supply of *Nucella* was maintained; it is clear, however, that if the barnacle population were not replaced annually, it would quickly be reduced to nothing and this, in turn, would limit the population of *Nucella*. Fortunately nature has a way of balancing itself and the annual increments of *Balanus* appear to suffice the needs of *Nucella*. This condition will probably be maintained until some catastrophe occurs and the ecological scales become unbalanced. Such an event occurred in the winter of 1962/63, and, as we have seen, it had a profound effect on the ecology of the area in the ensuing years.

It is clear that the environment on the Old Den at Spurn Point is a somewhat exceptional one for *Nucella*. Indeed, studies of the animal in the field strongly suggest that where barnacles are absent, the conditions for existence are extreme, and demand 'all the animal has to offer' in terms of behavioural adjustment. The success of *Nucella* on this pebble shoal reflects its remarkable capacity to withstand varying environmental conditions, and its ability to utilise the resources of the habitat in which it exists. Without this adaptability *Nucella* would have perished long ago on the ever changing environment of the Old Den.

A Key to the British species of Simuliidae (Diptera) in the Larval, Pupal and Adult Stages by Lewis Davis. Pp. 126 with 27 distribution maps. Freshwater Biological Association Scientific Publication No. 24, 1968. 10/-.

This is a really excellent little book. It is to be hoped that its publication will encourage both freshwater biologists and dipterists more interested in adult insects to study this very interesting family of flies. It supersedes John Smart's account of the family, published as No. 9 of the series 24 years ago. Comparison shows that the new publication has more than twice the number of pages of the old one and the content of information has increased by many times.

Dr. Davies had been carrying out critical taxonomic work on British Simuliidae for a number of years prior to his publication of 'The Taxonomy of British Black-flies (Diptera Simuliidae)' in *Trans. R. ent. Soc. London* 118, 413-506. Largely as a result of this work the number of described British species has increased from 19 to 35 and this is given as the basic reason for the new publication. The opportunity has been taken, though, to write an account much better in all ways than the very useful 1944 publication. Five pages are devoted to a precise description of methods of study of Simuliidae. Thirty-one pages are devoted to a diagnostic and descriptive key to the larvae (one British species not yet known in the larval form). This section also carries notes on biology and distribution. The head capsules of all species described are figured, as are the hypostomii, anal sclerites, anal gills, mandibles and palps of most. Well illustrated sections of 13 and 31 pp. respectively deal with the pupae and adults.

A short bibliography is followed by distribution maps for 27 species prepared by the Biological Records Centre of the Nature Conservancy. The most obvious conclusion from these maps is that much more collecting is necessary before the British distribution of the majority of species is known even in broad outline. Seventeen species are shown as recorded in Yorkshire. Four species are known from single localities only — one *Simulium latigonium* Rubtzov, an East European species, is known only from a single locality in Westmorland.

Comparatively little is known of the biting and other habits of the adults in Britain and Dr. Lewis mentions no wild mammal as host to the females and birds only in general terms and relative to three species. No mention is made of Simuliidae feeding on flower nectar, from which, presumably, British species satisfy some of their energy requirements. It is, perhaps, a pity that just a little more biological information could not have been given.

Clearly, study of the Simuliidae is in an interesting stage for an entomologist with a liking for upland streams in particular and undeterred by the difficulties of identification. In meeting these difficulties Dr. Davies' keys and figures will be of the greatest assistance.

K.G.P.

STUDIES ON THE FUNGI ASSOCIATED WITH HEALTHY AND DEGENERATE BRACKEN (*PTERIDIUM AQUILINUM*). THE ROOT AND RHIZOME SURFACE MYCOFLORA

K. J. POWELL

In 1961, during a survey of Ilkley Moor, Yorkshire, by the Wharfedale Naturalists' Society, it was noticed that certain areas of bracken (*Pteridium aquilinum* (L.) Kuhn) were being grazed by sheep (Fidler, 1963). Garrett Jones (1961) observed persistent grazing of bracken by sheep on hills in South Wales. The grazing continued year after year, the animals biting the main stalk and stripping its lateral branches. In such grazed areas bracken completely disappeared in 3-4 years. Sheep do not normally graze bracken, indeed there is evidence that it can be positively harmful (Evans and Mason 1965).

The bracken in grazed areas on Ilkley Moor was degenerating in a manner apparently similar to that in South Wales and it was at first thought that the cause of the degeneration was grazing. However, Fidler (1963) records that there is no record of grazing on the moor until the latter half of the summer which suggests that the degeneration might be due to some other cause, the grazing simply hastening the degeneration process. Once bracken grazing begins the damage done to the young fronds in the 'hook' stage by trampling and biting could have a significant effect on later crops of the plant. Colonisation of the degenerate areas by crowberry (*Empetrum nigrum*) occurs. To date no causal organism has been isolated from the degenerating stock.

The purpose of this investigation was to determine the surface mycoflora of root and rhizome of healthy and degenerate bracken to discover what effect the degeneration had on the fungi growing on the root and rhizome surface. It was hoped that this investigation might throw some light on the cause of the observed degeneration.

NATURE OF SITE

In the particular area of degeneration chosen for this investigation, bracken grows on a north-facing slope near its altitude limit on the moor (1,000 ft.). The site is devoid of trees and the prevailing wind is from the west. The rhizomes occur in several layers down to a depth of approximately twelve inches.

METHODS

Bracken rhizomes with associated roots were dug from selected sites placed in polythene bags and taken into the laboratory. Samples of the degenerate bracken were taken from the chosen site, while those of healthy bracken were taken from widely-spaced areas (2-3 miles) in order to obtain a representative sample.

METHOD APPLIED TO ROOTS

Roots from various points along the rhizome were snipped off and placed in McCartney bottles containing 10 ml. of sterile water, a maximum of five roots per bottle. A representative sample of roots was taken, ranging from light brown, young, active roots near the rhizome apex to dark brown, older roots some distance from the rhizome apex. Many roots had intact apices, especially young roots.

The roots were subjected to a serial washing in twenty changes of sterile water. The technique was similar to that suggested by Harley and Waid (Harley and Waid, 1955). Each bottle was shaken vigorously by hand for one minute. The roots were then transferred to a fresh bottle containing a further 10 ml. of sterile water. This process should remove all spores from the root surface and only mycelia living on the root surface should remain to be isolated. The validity of the technique was tested by plating 1 ml. aliquots from each washing into petri dishes containing molten but cooled agar, and the number of fungal colonies developing on the plates counted after three days. The findings, similar to Harley and Waid, were that twenty washings satisfactorily removed fungal spores from washed surfaces.

On completion of the washing, the roots were placed in petri dishes containing sterile water and cut with a sterile scalpel into 2 mm. fragments. The fragments were placed in petri dishes containing molten but cooled plain agar (2% w/v), five fragments per plate, and incubated at room temperature. Isolations of fungal hyphae were made on to Potato Dextrose agar slopes for identification. The majority of isolations were

made between 48–72 hours after incubation, but the plates were kept for three weeks before discarding.

The procedure was identical for roots from healthy and degenerate bracken.

METHOD APPLIED TO RHIZOMES

Using two, sterile, embedded razor blades, 2 mm. cylinders from various points along the length of the rhizome, were cut. These were placed in McCartney bottles containing 10 ml. of sterile water, a maximum of five cylinders per bottle, and subjected to a serial washing as for roots.

The rhizome cylinders were then plated, a maximum of five per plate, as for roots and incubated at room temperature. Care was taken to ensure that there was sufficient agar in each plate to cover the rhizome material. Isolations were made on to Potato Dextrose agar slopes as for roots.

RESULTS

To obtain information on the ecology of fungi growing on the root and rhizome surfaces, the results for each fungus are expressed as percentage frequency. A record was kept of the total number of segments plated and the number of segments infected with each fungus.

FOR ROOTS

$$\% \text{ frequency} = \frac{\text{Number of root segments infected with fungus}}{\text{Total root segments plated}} \times 100$$

FOR RHIZOMES

$$\% \text{ frequency} = \frac{\text{Number of rhizome cylinders infected with fungus}}{\text{Total rhizome cylinders plated}} \times 100$$

The table shows the percentage frequency of fungi isolated from the root and rhizome surfaces of healthy and degenerate bracken.

	ROOT SURFACE		RHIZOME SURFACE	
	Healthy	Degenerate	Healthy	Degenerate
<i>Aspergillus niger</i>	—	—	—	2
<i>Botrytis</i> sp.	3	2	—	—
<i>Candida</i> sp.	11	—	1	—
<i>Dactylaria</i> sp.	7	5	11	2
<i>Fusarium</i> sp.	2	—	—	—
<i>Mortierella</i> sp.	2	—	8	2
<i>Mucor</i> sp.	4	—	5	2
<i>Oospora</i> sp.	3	—	—	—
<i>Penicillium</i> sp.	18	4	8	7
<i>Phoma</i> sp.	—	1	—	—
Sterile dark	43	14	40	23
Sterile grey	2	2	11	—
Sterile white	—	4	8	—
Other sterile fungi	—	—	—	12
<i>Trichoderma viride</i>	2	5	7	12
Total number of cultures	156	61	141	98
Total number of fragments	160	169	146	160

ROOT SURFACE FLORA

(a) *Roots from healthy bracken*

Many of the fungi isolated are considered to be “normal” root surface inhabitants, such as members of the Mucorales, species of *Penicillium*, *Trichoderma* and *Fusarium*. The predominance of sterile fungi on the root surface, particularly dark forms, is a distinctive feature. Cultures of these dark forms were exposed in plastic petri dishes to ultra-violet light. Cultures of malt agar in boiling tubes were inoculated with pieces of bracken rhizome bearing roots. The top of each boiling tube was covered with tin-foil kept in place with an elastic band. During succeeding days, the fungi in nearly all tubes spread from the agar on to the rhizome, completely covering the surface of the rhizome with a dark grey mycelium.

Microscopic examination of this felt showed the presence of mycelial strands, but no complex organisation as found in rhizomorphs and equally in none of the irradiated cultures were sporulating structures produced.

The presence of *Dactylaria* sp. on the root surface is of interest as this would not be considered a normal root surface inhabitant. Contrary to previous reports on predaceous fungi (Duddington, 1962), this fungus developed numerous rings of the constricting type in culture in the complete absence of nematodes.

(b) *Roots from degenerate bracken*

Sterile forms again predominate, particularly sterile dark forms. No members of the Mucorales were isolated. There was a reduction in the number of genera isolated and a reduction in the percentage frequency of all fungi as compared with those values from "healthy" bracken.

Total percentage frequency of fungi from roots of healthy bracken = 97.0

Total percentage frequency of fungi from roots of degenerate bracken = 37.0

The only exception of note was *Trichoderma* sp. which showed an increased frequency on the root surface of degenerate bracken.

RHIZOME SURFACE FLORA

(a) *Rhizomes of healthy bracken*

The similarity between the mycoflora of the rhizome surface and root surface is interesting if not surprising. Sterile dark forms again predominate and the high incidence of *Dactylaria* is of note.

(b) *Rhizomes of degenerate bracken*

The findings are similar to those for roots, a reduction in the number of genera and a reduction in the percentage frequency of the fungi isolated as compared with those values from "healthy" rhizomes, with again the exception of *Trichoderma viride*.

Total percentage frequency of fungi from rhizomes of healthy bracken = 99.0

Total percentage frequency of fungi from rhizomes of degenerate bracken = 62.0

DISCUSSION

While there have been many investigations into the root surface mycoflora of angiosperms, Dickenson and Pugh (1965), Kubikova (1963), Parkinson, Taylor and Pearson (1963), Taylor and Parkinson (1961), Peterson, E. E. (1958), no published data on the surface mycoflora of roots and rhizomes of pteridophytes particularly *Pteridium aquilinum* has been found.

Reddy (1959) in his studies of the rhizospheres of pteridophytes (*Equisetum* sp., *Lastrea* spp., *Pteris* spp., and *Cyathea* sp.) indicated that there was a distinct 'rhizosphere effect' similar to that of angiosperms. Species of *Penicillium*, *Aspergillus* and *Trichoderma* were frequently isolated, pathogenic forms, like species of *Fusarium* were infrequently isolated. Reddy did not distinguish between the root surface (inner rhizosphere) and the soil immediately adjacent to roots (outer rhizosphere). This investigation has been confined to the inner rhizospheres of roots and rhizomes of bracken. It is reasonable to believe that underground perennating organs like rhizomes will stimulate micro-organisms in their vicinity in a similar way to roots.

The change in the root and rhizome mycoflora in healthy and degenerate bracken is a prominent feature of the results. The degenerate bracken is lower than the healthy with a considerable reduction in leaf surface area. Another feature of degenerate bracken is its early maturing, autumnal effects such as yellowing or browning of the fronds occurring in many cases before the end of June. These factors will undoubtedly affect the carbohydrate levels in the rhizome and root, much less food reserves would be expected in the degenerate root and rhizome than in those from healthy bracken. What effect, if any, would this have on the root and rhizome surface mycoflora?

There is evidence of a qualitative and quantitative difference in the root surface micro-flora with differing carbohydrate levels, from the work of Eaton and Rigler (1946). They investigated the influence of carbohydrate levels and root-surface micro-flora on the susceptibility of cotton and maize plants to *Phymatotrichum* root rot. Different carbohydrate levels produced qualitative and quantitative changes in the root-surface micro-flora, some organisms tending to increase in number, others tending to decrease. These changes in the root-surface micro-flora affected the susceptibility of the cotton to *Phymatotrichum* root rot. At high carbohydrate levels the plants were less susceptible to root rot than at low carbohydrate levels. Eaton and Rigler suggested

that at high carbohydrate levels there was inhibition of *Phymatotrichum* by antibiotics produced by other micro-organisms on the root surface. Changes in the micro-flora at low carbohydrate levels removed the anti-biosis, making the roots much more susceptible to attack by *Phymatotrichum*.

Bjorkmann (1944) found that strangulation of three-year-old pine plants, with a reduction in the amount of soluble carbohydrates in the roots, inhibited almost completely mycorrhizal development. The mycorrhizal fungi did not become parasitic, they simply stopped colonising the roots.

The essence of Eaton and Rigler's work is that on the root surface there exists a complex community of micro-organisms in a state of equilibrium, not static but dynamic. Any factors which disturb this equilibrium can have unforeseen and far-reaching consequences. In the case of cotton, differences in carbohydrate levels produced differences in the root surface micro-flora which affected the susceptibility of the host plant to *Phymatotrichum* root rot.

Other factors which can affect the root surface micro-flora and have been shown to be important in disease are soil type (Rishbeth, 1950), and the genetical constitution of the plant (Timonin, 1940).

Dealing with bracken degeneration, there is the possibility that a reduction in the root surface and rhizome surface mycoflora could make the bracken much more susceptible to soil-borne pathogens, but no fungus was isolated from the root or rhizome of degenerate bracken which would be likely to produce such marked effects as are seen in degenerating bracken. The major difference between root and rhizome surface mycoflora of healthy and degenerate bracken was one of quantity rather than quality.

It is a matter of conjecture whether the reduction in the mycoflora could be an initial cause of the degeneration, by making the roots much more susceptible to soil-borne pathogens or the reduction is an effect resulting from the degeneration by unknown causes. Without evidence to the contrary one is inclined to believe the second possibility, namely degeneration of bracken by causes unknown results in a decline in the fungal population on the root and rhizome surfaces. This decline could be due to a number of causes; a reduction in the carbohydrate levels in the root and rhizome for reasons given previously; changes in the root excretions, the roots of degenerate bracken having a reduced capacity for excretion, and differences in soil type in the healthy and degenerate areas. The possibility of differing genetical constitution of the degenerate bracken is unlikely to be of importance since healthy and degenerate areas adjoin and the line of demarcation is often distinct.

The present investigation, being confined to fungi, has found no organism which could be responsible for the bracken degeneration on Ilkley Moor. The cause of the degeneration may well not be fungal, other possible causal micro-organisms being bacteria or viruses.

The present methods of controlling and clearing land of bracken by burning and cutting are expensive and laborious. The identification of a definite causal organism producing degeneration and eventual disappearance of bracken would be invaluable if the organism could be introduced into healthy stock and, after introduction, result in clearance.

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THE INFILL OF MELT-WATER CHANNELS ON THE NORTH YORK MOORS

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I

The narrow channels which are incised into the flanks and plateaux of the North York Moors have attracted considerable attention from geologists and geomorphologists. Kendall (1902) and Elgee (1912) considered them to be glacial overflow channels, spillways for glacial lakes, whereas the more recent work of Gregory (1962) has placed them in the category of subglacial meltwater channels. All authors have remarked upon the infill of the "slacks", the term by which they are locally known. Gregory (1962) confines himself to the clays and gravels which are found above the solid rock at the bottom of the features; both Elgee and Kendall however remark upon the organic peats and Erdtman (1928) in his pioneer pollen analytical investigations gives details of the peat stratigraphy at Ewe Crag Slack (NZ 695110).

II

During the course of a wider programme of pollen analytical and stratigraphic investigation of peats of the North York Moors (Simmons, 1969), the peat infill of two channels was considered in some detail. Both were on the margins of Egton High Moor and are marked on Gregory's (1962) map of these features. Moss Swang, at an altitude of approximately 575 feet (175 m.) runs sinuously due south from near Egton Bridge (805048) to Julian Park (813009); Lady Bridge Slack curves along the plateau flank, above Moss Swang but parallel to it, at approximately 700 feet O.D. (212 m.).

The infill of the channels was investigated by means of a hand-worked borer of the Macaulay Institute type (Jowsey, 1966), which takes a series of continuous cores. The gross stratigraphy of the organic deposits was found not to vary laterally: wood and wood peats formed a 'lining' to the channels (at Lady Bridge Slack this was impenetrable and it is possible that further organic deposits exist below the wood layer which forms the base of the profile investigated in detail), and above them red-brown fibrous peats with varying amounts of wood fragments formed the bulk of the deposit, turning to a different deposit in the top few centimetres. The character of this uppermost peat varied according to the present day surface vegetation.

During the course of the preparation of samples for pollen analysis many subfossil plant remains were recorded and a fairly complete picture of the peat stratigraphy can be built up at Moss Swang (806035). This consisted of:

- (1) Contemporary rootlet peat 0-20 cm. Derived from the present vegetation dominated by *Erica tetralix*, *Eriophorum vaginatum* and *Sphagnum* spp.
- (2) Red-brown fibrous peat with wood remains 20-140 cm. Mainly *Carex* rootlets, with frequent silt and charcoal fragments; also wood, mainly *Betula* but some *Frangula*. A *Betula* fruit is present at 135 cm.

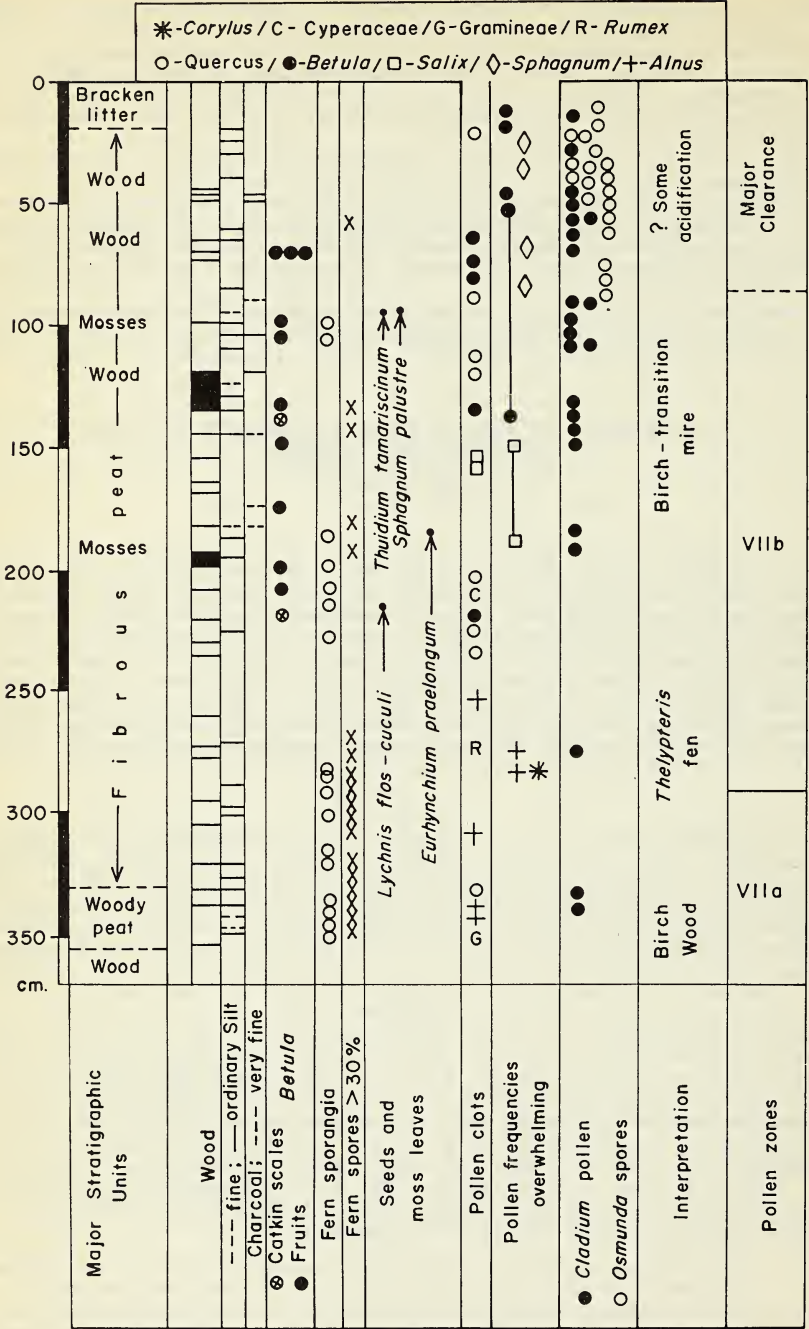


Fig. 1. Stratigraphy at Lady Bridge Slack.

- (3) Red-brown fibrous peat, with few wood remains 140–430 cm. *Carex* rootlets with rotted fern pinnae. Two bands of mosses: at 165 cm. (*Sphagnum fimbriatum*, *S. recurvum*, *S. palustre* and *Acrocladium stramineum*) and 250 cm. (*Acrocladium giganteum*).
- (4) Fibrous peat becoming woody 430–590 cm. *Betula* forms the bulk of the deposit near the base.
- (5) Fine grey clay. At 590 cm.

The stratigraphy in a bore at Lady Bridge Slack (804018) consisted of:

- (1) Contemporary peat 0–25 cm. Rhizomes and litter of bracken (*Pteridium aquilinum*).
- (2) Red-brown fibrous peat with wood remains 25–220 cm. The fibrous peat is mainly fern pinnae and the wood *Betula* and *Salix*. Silt and charcoal are present, as are fruits of *Betula* and fern sporangia. Two bands of mosses: at 100 cm. (*Thuidium tamariscinum* and *Sphagnum palustre*) and 180 cm. (*Eurhynchium praelongum*).
- (3) Fibrous peat with scattered wood remains 220–315 cm. Silt less frequent and charcoal absent but fern sporangia frequent.
- (4) Amorphous peat 315–350 cm. Frequent wood remains and much silt; fern sporangia present throughout.
- (5) At 352 cm. borer in impenetrable wood layer.

The remains found in this profile are summarised in Figure 1, which also tabulates the main features of the pollen analysis which relate to the development of the mire vegetation, i.e. overwhelming frequencies of a particular type and pollen “clots”, which probably signify local presence of the contributing plants, together with the pollen and spores of certain mire species, e.g. *Cladium mariscus* (saw sedge) and *Osmunda regalis* (royal fern).

These details enable the development of the peat-forming mire in Lady Bridge Slack to be reconstructed. The chronology can be suggested in outline from the tree pollen (not tabulated here): customary pollen zones are given as part of Figure 1. The woodland present in the channel during pollen zone VIIa (and probably before) was overwhelmed by a rising watertable and the fibrous peats with fern remains which represent a fen (probably dominated by *Thelypteris palustris*) accumulated during late zone VIIa and in zone VIIb. The continuing nearby presence of woodland (probably on the sides of the channel) is shown by the “clots” of *Alnus*, *Betula* and *Quercus* pollen, and the long period of overwhelming *Salix* frequencies betokens a fringing willow development.

Above 200 cm. can be seen the normal process of ecological succession. In this case the fen appears to go over to birchwood: the evidence of autochthonous *Betula* growth is strong (fruits, wood, pollen frequencies) and mosses characteristic of the transition to *Betula* carr are present. The high base-status suggested by the fern fen is continued, exemplified by the presence of *Cladium*, and the carr stage is corroborated by *Osmunda*. Finally, the high frequencies of *Sphagnum* spores (together with some pollen types of acid-tolerant plants not plotted on the diagram) suggest a limited acidification of the surface, some of which has subsequently been removed by peat cutting, for which there is evidence at this site.

This sequence, of wood inundated by the development of a fen which then undergoes succession back to woodland, can also be traced in the Moss Swang profile. Here the base of the organic deposits represents zone IV and the inundation of the wood peat takes place at the boundary of pollen zones VI/VIIa (the Boreal-Atlantic Transition), when the climate is generally supposed to have become wetter. The succession to woodland is not quite so marked as at Lady Bridge Slack but some high *Betula* pollen and *Betula* wood indicate the trend; transition mire mosses are present also. Again, limited evidence of acidification is present near the surface and the cessation of peat growth appears (from internal evidence in the full pollen diagrams) to have occurred about the same time as at Lady Bridge Slack. Neither site shows any signs of the climatic change which culminated in about 400 B.C. Since this is a relatively dry part of upland Britain it is perhaps possible that the increased wetness at that time did not cross the threshold necessary for a change in vegetation type, although it may be noted that the Boreal-Atlantic Transition change apparently did so. An alternative explanation is that both sites had stopped accumulating peat before the zone VIIb/VIII change. If the major forest clearance phase (Figure 1: this is transferred from the full pollen diagrams and occurs in an equivalent position at Moss Swang)

represents the incursion of the Bronze Age Urn people this suggestion is corroborated since their occupation would probably have predated the climatic change.

III

Descriptions of the fern-sedge fens which contributed the bulk of the deposits at both sites are not common in the literature. One of the closest parallels is described by Godwin and Clifford (1938) from Woodwalton Fen in Huntingdonshire. At this and adjacent sites the thickness of peat containing fern remains (identified as *Dryopteris thelypteris* = *Thelypteris palustris*) was much less and was generally the initial stage of an acid community. Nevertheless some species of mosses are common to both sites as is the presence of *Carex*. It is obvious that present-day peat-accumulating channel mires in the North York Moors, such as Fen Bogs in Newtondale, do not resemble the reconstructed fen since they are dominated by a *Sphagnum* carpet and have an acid-tolerant flora. A possible present-day equivalent of the fern-sedge stage, with *Cladium* present, is given by Bellamy (1967) for Strumpshaw in the valley of the River Yare, Norfolk. Here *Cladium* is in fact dominant but *Thelypteris palustris* is common also, as are three species of *Carex*, *Salix* spp., *Alnus*, *Lychnis flos-cuculi* and other species whose remains are represented at Lady Bridge Slack. The Strumpshaw site is in part of the main drainage channel of the Yare and possibly the slacks at one time had a more vigorous drainage than at present.

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TREE PLANTING ON FAIRBURN SPOIL-HEAPS

During the early part of 1969, volunteer parties of Wardens and other "friends of Fairburn" planted 500 pine, 1,000 alder, 500 sycamore and 2,000 birch on the slag heaps of the Nature Reserve. All these trees were supplied by the County authority who administer the reserve, but labour costs were obviated as a result of this splendid voluntary effort. Gifts of trees additional to the above were supplied by Sir William and Lady Worsley and the Castleford Inner Wheel. The Wardens themselves obtained a further supply of 1,500 trees from the Forestry Commission, these being larch and lodge-pole pine.

Planting, though not on this scale, has been proceeding for ten years and is already yielding not only a pleasanter background but habitats for additional species — e.g. Redpoll and Willow Warbler now breed. A pleasing feature of the planting programme this season, besides the scale of it, has been the help given by some of our younger visiting ornithologists and by one or two local schoolboys.

Other work has included the construction of rafts with Dutch-type duck-nesting baskets.

R. F. DICKENS

THE LEPIDOPTERA OF YORKSHIRE

(continued from p. 58)

Eupithecia centaureata Schiff. (Lime-speck Pug).

Widely distributed but seldom reported to be common except in the extreme south-east.

61. Spurn, often common as larvae and as imago; Selby, less common than formerly.

63. Little Horton near Bradford; Elland.

64. Harrogate, uncommon; Leeds; Selby district.

E. pulchellata Steph. (Foxglove Pug).

Fairly well distributed and probably to be found wherever there are plenty of Foxgloves.

E. linariata Fabr. (Toadflax Pug).

Widely distributed and seemingly commoner than the previous species. The larvae are usually freely obtainable wherever there is an established growth of wild toadflax.

E. tantillaria Boisd. (Dwarf Pug).

Not widely reported but probably has a wider distribution than the records suggest.

62. Buttercrambe Woods.

64. Bishop Wood; Harrogate, uncommon.

E. indigata Hubn. (Ochreous Pug).

Another insect which tends to be confined to the woods and is possibly overlooked as there are very few records.

61. Skipwith Common, used to be common but now seldom seen; Escrick Park, 1954.

62. Strensall Common.

64. Keighley; Ripon, one in a Pine copse on the Pateley Bridge road in May 1964; Bishop Wood, 20th August 1966.

E. venosata Fabr. (Netted Pug).

Local but recorded from widely separated areas. The moths are usually recorded singly but larvae are often found in numbers where there is a good growth of *Silene inflata* (Bladder Campion).

61. Shiptonthorpe, larvae in 1963; Spurn, larvae common in 1912, one moth in July 1948.

63. Beeston, larvae; Denby Dale, larvae in 1912; Elland; Tickhill, larvae in 1960.

64. Fairburn, larvae; Harrogate, larvae plentiful in 1965 and 1966; Leeds, 1967; Scholes, one in 1968.

65. Middleham, 1925.

E. pimpinellata Hubn. (Pimpinell Pug).

Not often recorded; unless fresh it is difficult to distinguish this insect from some of those which follow, it may therefore be taken more often than is realised. The larvae are however easily recognised.

64. Copgrove, larvae plentiful in 1964; Selby, at light in 1964 and 1965; York district.

E. distinctaria H.S. (Thyme Pug).

Not recorded since Porritt's List.

E. assimilata Doubl. (Currant Pug).

Not often reported but probably occurs in gardens and allotments on both currants and hops.

E. absinthiata Clerck. (Wormwood Pug).

Like the last species must also be commoner than the records suggest although in this case they are more numerous and indicate a very wide distribution throughout those areas which are worked regularly.

E. goossensiata Mab. (Ling Pug).

Recorded mainly from the low lying heaths, it certainly prefers heather growing among trees and has not been reported from the higher moorland areas of the Pennines.

61. Skipwith Common.

62. Langdale End, 1932; Strensall Common.

E. albipunctata Haw. (White-spotted Pug).

Local and not often recorded. The black form var. *angelicata* was recorded in Porritt's List and no doubt still occurs; if it has become as prevalent as the melanic forms of some other insects this could account for the scarcity of recent records as this form is difficult to separate from the melanic form of other species of the genus.

61. Everingham, 1924; Kilnsea, 1947; Skipwith, 1924; Selby, occasional larvae in recent years; Thixendale.

62. Linthorpe, 1915.

64. Askham Bog, 1966; Harrogate, uncommon; Leeds.

E. vulgata Haw. (Common Pug).

Widely distributed and often common, even in urban areas.

E. vigaureata Doubl. (Golden Rod Pug).

A scarce and local species, apparently confined to the eastern parts of the county.

61. Kilnsea, larvae in July 1950; Skipwith, 1903.

62. Pickering, between the wars; Scarborough, 1958.

E. trisignaria H.S. (Triple-spotted Pug).

Another species for which the only really reliable records are those of larvae.

63. Wadworth Wood, 1903.

64. Bishop Wood, larvae in 1956; Harrogate, larvae in 1962.

E. lariciata Frey. (Larch Pug).

Widespread and usually common in well-established Larch plantations. The melanic form outnumbers the type in the Pine Woods at Harrogate (64).

E. castigata Hubn. (Grey Pug).

Widely distributed and probably one of the commonest 'pugs' in the county. This species also has a melanic form which is usually more abundant than the type in industrial areas.

E. extensaria Frey. (Scarce Pug).

There are few British localities for this insect; the most northerly is at Kilnsea (61) where the larvae are often plentiful on *Artemisia maritima* (Sea Wormwood).

E. satyrata Hubn. (Satyr Pug).

Local and uncommon except in the Pickering area where it is well established; otherwise only occasional specimens have been recorded.

62. Pickering, in Gundale; Thornton Dale, 1964; Strensall, 1903.

63. Little Horton near Bradford.

64. Harrogate, uncommon.

E. succenturiata Linn. (Bordered Pug).

Not common and usually occurs as single specimens at light.

63. Little Horton near Bradford, 1952; Shipley, 1949-1951.

64. Leeds, 1958 and 1959; Selby district, a few up to 1964.

65. Boroughbridge district, larvae from *Artemisia vulgaris* (Mugwort) in 1963 and 1964.

E. icterata Vill. (Tawny Speckled Pug).

Widely distributed; moths are often recorded in small numbers, but larvae can be abundant on *Achillea millefolium* (Yarrow) late in the year.

61. Kilnsea, larvae 1948; Selby district, not uncommon.

62. Strensall Common, 1964.

63. Little Horton; Ilkley, 1953; Shipley.

64. Harrogate, larvae in 1965; Leeds, 1957.

E. haworthiata Doubl. (Haworth's Pug).

The original locality, given in Porritt's List as Wadworth Wood (63), has not been worked recently. Two new localities have been discovered.

63. Wentbridge, larvae plentiful in 1967.

64. Monk Fryston, larvae in 1954 and on several occasions since.

E. valerianata Hubn. (Valerian Pug).

The only recent records are from Grass Wood (64) where larvae have been taken frequently in recent years.

62. Great Ayton, 1913.

63. Wharnccliffe near Sheffield, 1903.

64. Askham Bog, no recent records; Grass Wood, larvae frequently common.

E. plumbeolata Haw. (Lead-coloured Pug).

There is only one record since Porritt's List. The moths were taken flying over the food-plant *Melampyrum pratense* (Cow-wheat) at Miry Greaves near Skelmanthorpe (63) on 28th May 1916.

E. palustraria Doubl. (Marsh Pug).

There is only one record in the last twenty years. Some of the old records have not been followed up but around Selby it seems to have disappeared after 1933.

61. Selby area, until 1933.

62. Buttercrambe, 1944; Strensall, 1941.

63. Skelmanthorpe, 1916.

64. Askham Bog, one in 1963; Grassington, 1905.

E. tenuiata Hubn. (Slender Pug).

Very local and seldom taken, perhaps it is sometimes overlooked as it is inconspicuous both as larva and as imago.

61. Skipwith Common, one, 13th July 1963; Stamford Bridge, larvae in Sallow catkins in 1965.

E. inturbata Hufn. (Maple Pug).

The only record in Porritt's List was for Copgrove (64) in 1876. It's continued presence in this locality was established when larvae were beaten there in May 1963 and again in the following year.

E. fraxinata Crewe. (Ash Pug).

Widely distributed but not often common. Larvae beaten from Sea Buckthorn at Kilnsea (61) are probably referable to this species rather than to *E. innotata* to which they were originally referred. (See 1961, *Entomologist's Rec.*, 73: 210, 261, also 1963, *Entomologist's Gazette*, 14: 13.)

61. Kilnsea, larvae on Sea Buckthorn in 1960; Thixendale, one larva in 1965.

63. Denton Moors, larvae on Ash; Little Horton, 1967; Skelmanthorpe, 1910; Womersley, 1967.

64. Grassington, larvae; Harrogate, at light 1957 to 1965; Monk Fryston, larvae 1964; Leeds, 1959 and 1967.

E. nanata Hubn. (Narrow-winged Pug).

Widely distributed and often common wherever there is a good expanse of Heather, both on high and low ground.

E. abbreviata Steph. (Brindled Pug).

Not often recorded and then only from the Oak woods near Selby (64) particularly from Bishop Wood where it is well established.

E. dodoneata Guen. (Oak-tree Pug).

Not recorded since Porritt's List.

E. exigua Hubn. (Mottled Pug).

There are only sporadic records over a fairly wide area.

64. Askham Bog, larvae 1966 and 1967; Bramham, 4th June 1950; Harrogate, 14th June 1958 and occasionally in subsequent years; Hetchell Craggs near Leeds, 11th June 1968; Knaresborough, in Birkham Wood in 1962.

E. sobrinata Hubn. (Juniper Pug).

Most records are from gardens and built-up areas, suggesting that the species has been introduced with planted Junipers. All the records, except that from Swaledale, are from areas where Juniper does not grow wild.

62. Pickering, 17th June 1961.

64. Harrogate, 1965; Far Headingley, 1959 and 1960.

65. In Swaledale near Richmond, 1955.

E. pini Linn. (Cloaked Pug).

Only a single specimen was recorded in Porritt's List. A second specimen was recorded at Bolton near Bradford (63), taken at M.V. light on 14th June 1966 (*Naturalist*, 1968; 19). It must be presumed that it had been accidentally introduced into the area, possibly as a pupa.

E. subnotata Hubn. (Plain Pug).

Scarce, occurring sporadically with no evidence of being firmly established in any part of the county.

61. Kilnsea, one in July 1948.

64. Far Headingley, 10th July 1960; Selby, two in 1947.

E. subumbrata Schiff. (Shaded Pug).

Very local but well established in at least one locality and might well be found elsewhere in the Wolds.

61. Garrowby, before 1940; Thixendale, at M.V. light 5th July 1962, subsequently the larvae have been found to be not uncommon there on the flowers of Scabious.

Gymnoscelis pumilata Hubn. (Double-striped Pug).

Very uncommon with only three records in the last twenty years.

64. Harrogate, February 1965; Malham Tarn, July 1968; Leeds once.

Chloroclystis coronata Hubn. (V Pug).

The comparatively small number of widely scattered records suggest that this pretty little moth is frequently overlooked in spite of being one of the more easily identifiable 'pugs'.

63. Frizinghall near Bradford, 23rd September 1965; Chevet near Wakefield, 9th June 1945; Walton Hall Park near Wakefield, 1918.

64. Harrogate, 13th September 1960; Temple Newsam, 4th July 1941; Leeds, one in 1962.

C. rectangularis Linn. (Green Pug).

Widely distributed and often quite common, particularly in built-up areas where fruit trees are grown in any quantity.

Anticollis sparsata Treits. (Dentated Pug).

Very local but often abundant where it occurs; its presence depends on the existence of its only known food-plant *Lysimachia vulgaris* (Yellow Loosestrife).

63. Thorne Moor, formerly taken regularly but not in recent years.

64. Askham Bog, well established and sometimes plentiful; Selby district, in a damp wood, 1959 to 1963.

Abraxas sylvata Scop. (Clouded Magpie).

Widely distributed and sometimes plentiful where Wych Elm is well established. No notable variations have been recorded in recent years.

62. Hutton-le-hole, 1937; Scarborough, in Raincliffe Woods in 1967.

63. Doncaster, in the Red House district; Edlington Wood; Elland; Halifax; Wentbridge.

64. Baildon; Bishop Wood; Bolton-by-Bowland; Grassington, 1952; Knaresborough, at Scotton Banks; Scarthgillwell; Selby district.

A. grossulariata Linn. (Magpie).

Not as common as formerly but still widely distributed. It occurs both in gardens and in the open country where it feeds on Sloe. Var *varleyata* has been bred in recent years from specimens taken in the Bradford area (63).

Lomasipilis marginata Linn. (Clouded Border).

Widely distributed and sometimes plentiful among Sallow and Aspen.

61. Skipwith Common.

62. Buttercrambe Wood; Strensall Common.

63. Little Horton near Bradford; Wentbridge.

64. Askham Bog; Bishop Wood; Harrogate; Kirkham Abbey; Knaresborough; Breary Marsh, Leeds.

Ligdia adustata Schiff. (Scorched Carpet).

Not often taken and now very local, being confined entirely to its food-plant the Spindle Tree; it has only been reported in one locality in the last thirty years.

62. Pickering, in Gundale in 1953 and 1954.

63. Edlington Wood, 1917; Wadworth Wood, one in the early 1930's.

64. Grassington, included in a list for Grass Wood published in 1932.

Percontia strigillaria Hubn. (Grass Wave).

Very local and not as widely distributed as might be expected in view of the range of heaths and moors in the country.

61. Allerthorpe Common, still plentiful in spite of recent afforestation.

62. Danby, at Ewe Crag Slack in 1903; Hackness, 1936; Strensall Common.

64. Ilkley, before 1907.

Aspitates gilvaria Fabr. (Yellow Belle).

This was added to the Yorkshire List when S. M. Jackson took a solitary female at Kilnsea (61) on 15th June 1951. Fertile ova were obtained and moths bred but no other wild specimens have been reported.

(to be continued)

ENTOMOLOGICAL MEETING AT SKIPWITH COMMON

25th May 1968

P. SKIDMORE

Despite the rather dismal weather prevailing during the period when this meeting took place, it was tolerably well attended for nine members turned up. Though fairly warm, it was dull all day and windy. The interests represented at the meeting were wide and hence a fairly comprehensive list of species was obtained. By the nature of the terrain it is not easy to arrange the species purely ecologically and hence the following list is arranged more or less in the system of Kloet & Hincks (1945).

Initials refer to following collectors: T.F. — T. Ford; A.W. — A. Wright; J.H.F. — J. H. Flint; J.F. — Jeremy Flint; P.S. — P. Skidmore; E.W.A. — E. W. Aubrook.

PSOCOPTERA:

Amphigerontia contaminata (Steph.); adults common (P.S.).

ODONATA:

Pyrrosoma nymphula (Sulzer); adults common.

HEMIPTERA:

Elasmotherus interstinctus (L.); adults sparingly on birch.

Elasmucha grisea (L.); adults sparingly on birch.

Cymus glandicolor Hahn; adults common.

Anthocoris nemoralis (F.); adults common.

A. confusus (Reuter); adults common.

Monalocoris filicis (L.); adults common.

Hebrus ruficeps (Thomson); one adult (J.H.F.).

Notonecta glauca L.; several in dyke (J.F.).

MEGALOPTERA:

Raphidia xanthostigma (Schummel); one adult beaten from willow (T.F.).

NEUROPTERA:

Micromus variegatus (F.); adults sparingly (P.S.).

Hemerobius nitidulus F.; adults on pines (E.W.A.).

Kimminsia nervosa (F.); adults on pines (E.W.A.).

LEPIDOPTERA:

Micropteryx calthella (L.); adults common on *Ranunculus*, etc.

Hypocrita jacobaeae (L.); adults sparingly.

Brephos parthenias (L.); few larvae (T.F.).

Ectropis punctularia (Hb.) (T.F.).

Ematurga atomaria (L.); adults common.

Hybernia defoliaria (Clerck); larvae numerous (T.F.).

H. aurantiaria (Esper); larvae (T.F.).

Phigalia pedaria (F.); larvae.

Campaea margaritaria (L.); larvae (T.F.).

Lycaena phlaeas (L.); adults sparingly.

Pieris brassicae (L.); adults sparingly.

P. napi (L.); adults sparingly.

Macrothylacia rubi (L.); one larva (A.W.).

Trichiura crataegi (L.); larvae (T.F.).

Psychid cases on heather (P.S.).

Eulia ministrana (L.); adults common on birches (P.S., J.H.F.).

COLEOPTERA:

Bembidion lampros (Hbst.); adults on paths, etc.

Acupalpus dubius Schilsky; adults sparingly in Sphagnum.

Pterostichus minor (Gyll.); adults sparingly in Sphagnum.

P. diligens Sturm.; adults sparingly in Sphagnum.

Agonum gracilis (Gyll.); adults sparingly in Sphagnum.

Noterus clavicornis Deg.; adults in dyke (J.F.).

Hydroporus lineatus (F.); adults in dyke (J.F.).

H. planus (F.); adults in dyke (J.F.).

H. dorsalis (F.); adults in dyke (J.F.).

Agabus sturmii (Gyll.); adults in dyke (J.F.).
A. bipustulatus (L.); adults in dyke (J.F.).
Ilybius ater (Deg.); adults in dyke (J.F.).
I. fuliginosus (F.); adults in dyke (J.F.).
I. obscurus (Marsham); adults in dyke (J.F.).
I. guttiger (Gyll.); adults in dyke (J.F.).
Rantus exsoletus (Forster); adults in dyke (J.F.).
Dytiscus marginalis L.; adults in dyke (J.F.).
Acilus sulcatus (L.); adults in dyke (J.F.).
A. canaliculatus (Nic.); adults in dyke (J.F.).
Athous haemorrhoidalis (F.); adults common.
Corymbites incanus (Gyll.); adults common.
Rhagonycha lignosa (Ml.); adults common on oaks.
Adalia 10-punctata (L.); adults abundant.
A. bipunctata (L.); adults abundant.
Calvia 14-guttata (L.); adults on birches.
Propylea 14-punctata (L.); adults common.
Anaspis rufilabris Gyll.; adults common.
A. maculata Geoffroy; adults common.
Lochmaea suturalis (Thoms.); adults abundant on *Calluna*.
Chalcoides fulvicornis (F.); adults numerous on willows.
Deporaus betulae (L.); adults common on birches.
Phyllobius argentatus (L.); adults common on bushes.
P. pyri (L.); adults abundant.
Polydrosus cervinus (L.); adults common.
Apion ulicis (Forster); adults abundant on gorse.
Sitona regensteiniensis (Hbst.); adults numerous on gorse and broom.
Coeliodes rubicundus (Hbst.); adults sparingly on oaks, etc.
Cidnorrhinus 4-maculatus (L.); adults abundant on nettles.
Ceuthorrhynchus pollinarius (Forster); adults common on nettles.

HYMENOPTERA:

Dolerus gonager (F.); adults common.
Ametastegia albipes (Thoms.); one female (P.S.).
Aglaostigma fulvipes (Scop.); adults sparingly.
Selandria serva (F.); one adult amongst *Caricetum*.
Biorrhiza pallida (Oliv.); new galls on oak.
Bombus hortorum (L.); adults at willow, etc.
Apis mellifera L.; adults at willow, etc.

DIPTERA:

Prionocera turcica (F.); adults frequent; pupae in dykes.
Tipula variipennis Mg.; adults sparingly.
Limnophila meigeni Verrall; adults in numbers.
Bibio marci L.; adults common.
Dilophus febrilis (L.); adults abundant.
Dolichopus popularis Wd.; adults common.
Lonchoptera lutea Pz.; adults common.
Eristalis sepulchralis (L.); adults sparingly.
Helophilus lineatus (F.); one adult in *Caricetum*.
Neoscasia dispar (Mg.); adults common.
Syrphus lunulatus Mg.; one adult.
S. ribesii (L.); adults common.
Renocera pallida (Fallen); adults sparingly along dyke (P.S.).
Tetanocera ferruginea Fallen; adults sparingly in damp places.
Hydromyia dorsalis (F.); one adult by dyke.
Amaurosoma armillatum (Zett.); adults common.
Chaetosa punctipes (Mg.); adults numerous.
Scatophaga squalida Mg.; adults common.
Degeeria collaris (Fallen); adults common on birches.
Musca autumnalis Deg.; adults common.
Morellia simplex (Lw.); adults numerous.
Hydrotaea dentipes (F.); adults common.

Trichopticoidea decolor (Fallen); females common.
Thricops semicinereus (Wd.); adults common.
Phaonia variegata (Mg.); adults sparingly on tree trunks.
Hebecnema affinis Malloch; adults common.
H. umbratica (Mg.); adults common.
Hydrophoria comica (Wd.); adults sparingly in wooded parts.
Hylemyia strigosa (F.); adults abundant in wooded parts.

ENTOMOLOGICAL MEETING AT HAW PARK

7th SEPTEMBER 1968

P. SKIDMORE

Due to the somewhat inclement weather this meeting was poorly attended, only four Yorkshire entomologists, Mr. and Mrs. J. H. Flint, P. Skidmore, and R. Crossley, and two Lancashire men, Mr. L. N. Kidd and Mr. B. Clayton, braved the elements to examine the fauna of Haw Park. However, an extraordinarily wide range of interests were represented and hence the list of species recorded was quite comprehensive. The most interesting records were the result of Mr. L. N. Kidd's activities amongst the fungus gnats — a much neglected group of flies in which Mr. Kidd has taken a particular interest. Five fungus gnats were new to Yorkshire as also was the sawfly *Stauronematus compressicornis* of which a larva was beaten from *Populus tremula* by Mr. Flint. These new records, and some additional new vice-county records resulting from this meeting have already been published in the Y.N.U. Annual Report for 1968 (Nat., 1969, 13-16). The area worked at Haw Park was the woodland adjacent to the canal, where the dominant trees are oak, birch and larch with a few aspens and a dense scrub of various willows and hazel. The list is arranged ecologically.

On oaks:

Caecilius flavidus (Steph.) (Psocoptera); common (P.S.).
Megacoleum infusum (H.-S.) (Hemiptera); one specimen (J.H.F.).
Dasycera sulphurella (F.) (Lepidoptera); larvae beneath bark (P.S.).
Andricus fecundator (Hart.) (Hymenoptera); galls common (P.S.).
Neuroterus quercus-baccarum (L.) (Hymenoptera); galls common (P.S.).
Chrysopa flava (Scop.) (Neuroptera); adults common (P.S.).
Hemerobius lutescens F. (Neuroptera); adults common (P.S.).
Micromus variegatus (F.) (Neuroptera); few adults (P.S.).

On willows:

Idiocerus confusus Flor. (Hemiptera); adults common (J.H.F.).
Chilocorus renipustulatus (Scriba) (Coleoptera); several adults on one tree (P.S.).
Chalcoides fulvicornis (F.) (Coleoptera); adults common (J.H.F.).
Rhynchaenus salicis (L.) (Coleoptera); adults common (J.H.F.).

On aspen:

Laothoe populi (L.) (Lepidoptera); one larva (R.C.).
Idiocerus populi (L.) (Hemiptera); few adults (J.H.F.).
† *Stauronematus compressicornis* (F.) (Hymenoptera); one larva (J.H.F.).

On hazel:

Lithocolletis stettinensis, von Nic. (Lepidoptera); mines in leaves (P.S.).
Malacocoris chlorizans (Pz.) (Hemiptera); adults in numbers (J.H.F., R.C.).

On alder:

Neomecomma bilineatus (Fallen) (Hemiptera); adults on one tree (J.H.F.).

By sweeping herbage layer in woods:

Forficula auricularia L. (Dermaptera); common (P.S.).
Ceramica pisi (L.) (Lepidoptera); larvae sparingly (R.C.).
Philaenus leucophthalmus (L.) (Hemiptera); adults abundant.
P. lineatus (L.) (Hemiptera); adults abundant.
Allygus mixtus (F.) (Hemiptera); adults (J.H.F.).
Cicadula quadrinotata (Boh.) (Hemiptera); adults (J.H.F.).
Macrostelus viridigriseus Edw. (Hemiptera); adults (J.H.F.).
Cixius nervosus (L.) (Hemiptera); adults (J.H.F.).
C. distinguendus Kirsch. (Hemiptera); adults (J.H.F.).
Aphalara exilis (W. & M.) (Hemiptera); adults abundant on *Rumex* (P.S.).
Stenodema calcaratum (Fallen) (Hemiptera); adults numerous (J.H.F., R.C.).
Phytocoris pini Kirsch. (Hemiptera).

Lygocoris pabulinus (L.) (Hemiptera).
Dicyphus errans (Wolff.) (Hemiptera).
Blepharidopterus angulatus (Fallen) (Hemiptera).
Monalocoris filicis (L.) (Hemiptera); adults abundant on ferns.
Adonia variegata (Gz.) (Coleoptera).
Adalia bipunctata (L.) (Coleoptera); adults common.
A. decimpunctata (L.) (Coleoptera); adults common.
Propylea 14-punctata (L.) (Coleoptera); adults common.
Scymnus nigrinus Kug. (Coleoptera); one adult under conifers (J.H.F.).
Coccinella 11-punctata (L.) (Coleoptera); adults common.
Otiorrhynchus singularis (L.) (Coleoptera); adults in numbers (P.S.).
O. sulcatus (F.) (Coleoptera); adults.
Strophosomus melanogrammus (Forst.) (Coleoptera); adults common.
Tipula paludosa Mg. (Diptera); adults abundant (P.S.).
Limonia maculata (Mg.) (Diptera); adults common (P.S.).

The following fungus gnats were taken by L.N.K.:

Bolitophila hybrida (Mg.); *Macrocera vittata* Mg.; *M. fasciata* Mg. (*); *Mycomyia duplicata* Edw. (†); *M. incisurata* (Zett.); *Boletina gripha* Dzied. (*); *Exechia dorsalis* (Staeger) (†); *E. separata* Lundstroem (†); *E. nigroscutellata* Landrock (†); *E. subulata* Winnertz; *Allodia ornaticollis* (Mg.); *A. sericoma* (Mg.) (*); *Cordyla fasciata* Mg. (†); *C. flaviceps* (Staeger); *Mycetophila fungorum* (Deg.); *M. lineola* Mg. (*); *M. luctuosa* Mg. (*); *M. signatoides* Dzied.
Argyra leucocephala (Mg.) (Diptera); adults common (P.S.).
Nochoptera lutea Pz. (Diptera); adults common (P.S.).
Calliopum aeneum (Fallen) (Diptera); adults (P.S.).
Neuroctena anilis (Fallen) (Diptera); few adults about rotting fungi (P.S.).
Opomyza germinationis (L.) (Diptera); adults abundant (P.S.).
Scatophaga stercoraria (L.) (Diptera); adults abundant (P.S.).
Helina impuncta (Fallen) (Diptera); adults abundant (P.S.).
H. ciliatocosta (Zett.) (Diptera); few adults (P.S.).
Pycnoglossa flavipennis (Fallen) (Diptera); adults on *Pteris* (P.S.).

On conifers:

Aphidecta oblitterata (L.) (Coleoptera); adults (J.H.F.).
Harmenia 4-punctata (Pont.) (Coleoptera); one adult (J.H.F.).

On Umbelliferae and other flowers, and foliage:

Pararge megera (L.) (Lepidoptera); adults common.
Pieris napi (L.) (Lepidoptera); adults common.
Lycaena phlaeas (L.) (Lepidoptera); adults sparingly (P.S.).
Stigmella anomalella (Gz.) (Lepidoptera); two leaves of a rose bush bore the unmistakable mines of this moth (P.S.).
Syrphus luniger (Mg.) (Diptera); adults common (P.S., R.C.).
S. balteatus (Deg.) (Diptera); adults abundant.
S. ribesii (L.) (Diptera); adults abundant.
S. glaucius (L.) (Diptera); adults common on umbels.
S. cinctellus (Zett.) (Diptera); adults common (R.C.).
Scaeva pyrastris (L.) (Diptera); adults common.
Melanostoma mellinum (L.) (Diptera); adults common.
Sphaerophoria scripta (L.) (Diptera); adults.
Chrysotoxum arcuatum (L.) (Diptera); adults sparingly (R.C., P.S.).
Eristalis tenax (L.) (Diptera); adults common.
E. pertinax (Scop.) (Diptera); adults common.
Helophilus pendulus (L.) (Diptera); adults common.
Varichaeta radicum (F.) (Diptera); adults sparingly (P.S.).
Calliphora vomitoria (L.) (Diptera); adults numerous (P.S.).
Acrophaga subalpina (Ringd.) (Diptera); adults sparingly (P.S.).
Morelia simplex (Lw.) (Diptera); adults abundant (P.S.).
Polietes lardarius (F.) (Diptera); adults abundant (P.S.).
Muscina assimilis (Fall.) (Diptera); adults abundant (P.S.).
Drymeia hamata (Fall.) (Diptera); adults abundant (P.S.).
Trichopticoides decolor (Fall.) (Diptera); adults common (P.S.).
Phaomia basalis (Zett.) (Diptera); adults numerous (P.S.).
P. halterata (Stein.) (Diptera); adults sparingly (P.S.).
Lophosceles cristatus (Zett.) (Diptera); adults common (P.S.).

Hebecnema affinis Malloch. (Diptera); adults abundant (P.S.).
Mydaea urbana (Mg.) (Diptera); adults abundant (P.S.).
M. tincta (Zett.) (Diptera); adults sparingly (P.S.).
Graphomyia maculata (Scop.) (Diptera); adults common (P.S.).
Limnophora maculosa (Mg.) (Diptera); one female (P.S.).
Hylemyia strigosa (F.) (Diptera); adults abundant (P.S.).
Tenthredo arcuata Forster (Hymenoptera); adults common.
Vespa rufa L. (Hymenoptera); adults common.

On tree trunks:

Anisopus punctatus (F.) (Diptera); adults sparingly (P.S.).
Rhagio lineola F. (Diptera); adults abundant (P.S.).
Helomyza v. hilaris Zett. (Diptera); adults sparingly (P.S.).
Alloeostylus diaphanus (Wd.) (Diptera) adults sparingly (P.S.).
Phaonia signata (Mg.) (Diptera); adults common (P.S.).
P. scutellaris (Fall.) (Diptera); adults common (P.S.).
P. gobertii (Mik.) (Diptera); adults common (P.S.).
P. errans (Mg.) (Diptera); adults abundant (P.S.).

On waterside vegetation:

Limnephilus affinis Curtis (Trichoptera); adults common (P.S.).
Anabolia nervosa (Curtis) (Trichoptera); adults common (P.S.).
Mystacides longicornis (L.) (Trichoptera); adults common (P.S.).
Mompha raschkiella (Zeller) (Lepidoptera); larval mines in Rosebay (P.S.).
Elachista cerusella (Hb.) (Lepidoptera); old mines in *Phalaris* (P.S.).
Anisosticta 19-punctata (L.) (Coleoptera); adults sparingly.
Wachtliella persicariae (L.) (Diptera); galls on *Polygonum amphibium* (P.S.).
Tetanocera laevifrons Lw. (Diptera); adults common (P.S.).
T. elata (F.) (Diptera); adults common (P.S.).
T. ferruginea Fall. (Diptera); adults common (P.S.).
 **Liriomyza amoena* Mg. (Diptera); mines in *Sambucus nigra* (P.S.).
 **Phytomyza angelicastris* Hg. (Diptera); mines in *Angelica* (P.S.).
Spaziphora hydromyzina (Fallen) (Diptera); adults common (P.S.).
Trichopalpus fraternus (Mg.) (Diptera); adults common (P.S.).
Cnemopogon apicalis (Wd.) (Diptera); adults common (P.S.).
Limnophora maculosa (Mg.) (Diptera); one female (P.S.).

On patches of exposed earth:

Agonum ruficorne (Gz.) (Coleoptera); adults common.
Bembidion lampros (Host.) (Coleoptera); adults on lane through wood (J.H.F.).
Pterostichus angustatus (Duft.) (Coleoptera); one adult in plantation (J.H.F.).
Scellus notatus (F.) (Diptera); adults sparingly on path by canal (P.S., L.N.K.).

In rotting fungi:

Quedius ochripennis (Menetries) (Coleoptera); adults sparingly (J.H.F.).
Lordithon lunulatus (L.) (Coleoptera); adults common (J.H.F.).

In dead trees:

Scolytus ?multistriatus F. (Coleoptera); old borings in elm (J.H.F., P.S.).
Trypodendron domesticum (L.) (Coleoptera); old borings in birch (P.S., J.H.F.).

Pleasure from Insects by Michael Lehane. Pp. 172 with 17 plates and many line drawings by Joyce Bee. David and Charles: Newton Abbot, 1968. 30/-.

Those naturalists, country-lovers and photographers who wish to find enjoyment in watching or photographing insects will find this an instructive and inspiring book. It gives a general account of a variety of insects, attractive butterflies, dragonflies, beetles, also spiders and other small invertebrates. The black and white plates, all but one from photographs by the author, are excellent indeed and even contrive to give to woodlice an esoteric beauty of their own. The many line drawings are both decorative and instructive.

Life histories and behaviour are described and the reader is told how to search for and find his quarry — and how to plant a garden to attract insects. This is not a book for entomologists. Photographers however, will find this a very useful guide to methods of photographing insects. The pleasure the author has found in insects is enthusiastically conveyed and this is a book to give to anyone with a developed bump of curiosity and a moderately good camera.

J.H.F.

MARK MOWBRAY SAYER

(1895-1969)

Mark Sayer loved beautiful things, music, poetry, architecture, wild flowers. Whilst having a scientific, enquiring, mathematical mind — he represented Yorkshire at bridge before the last war — he also had a great love of the arts.

A native of Chelsea, he was educated at Rugby, his career in the Inland Revenue bringing him to Halifax in 1920. He was not content merely to enjoy the things he loved, but actively used his talents to encourage and organize those associations and institutions with which he allied himself.

Mark was Chairman of the Halifax Philharmonic Club, a past Chairman of the now defunct Halifax and District Association for the Encouragement of the Arts and held office as President and Treasurer of the former Halifax Literary and Philosophical Society. He was for many years keenly interested in church architecture, his interests turning to wild flowers shortly before the time he joined the Y.N.U. in 1947. From then onwards he and his wife were frequent attenders at Y.N.U. field meetings until serious illness incapacitated his wife. His botanical interests were not confined to British plants for he travelled widely on the Continent and was always on the look out for new plants. He became Treasurer of the Y.N.U. in 1956, continuing in office for twelve years; he was also keenly interested in conservation and an active supporter of the Yorkshire Naturalists' Trust.

Members of the Union will remember Mark Sayer as a good companion on many field excursions and as a Treasurer who maintained the Union's finances on a sound footing for many years.

ARTHUR C. COLLINGE

JENNIE GRAINGER

(1891-1969)

Jennie Grainger died at Greenacres, Meltham, on Ascension Day (15th May) in her 78th year and was buried in the churchyard of Helme, near the church school where she had served as headmistress for twenty-nine years until her retirement in April 1965. The mourners at the funeral service included old scholars and colleagues of Wilberlee School, Slaithwaite, and the Helme School, as well as fellow members of the Church Council of Wilshaw and Helme, and other friends and relatives, and representatives of the Yorkshire Naturalists' Union.

She joined the Y.N.U. in 1920, her early interests being in wild flowers and their ecology. She will be remembered by Y.N.U. mycologists as one of the happiest and most faithful of Honorary Secretaries. With unflinching interest, for a quarter of a century she had planned the details of the spring and autumn Fungus Forays, scouring the Yorkshire countryside in her little car, with her constant companion 'Mickey' on the back seat (which served day and night as his kennel), seeking suitable accommodation, a good workroom in particular. Indeed a more resourceful and reliable secretary it is hard to imagine, although she almost directly followed the famous A. E. Peck who, when he was made chairman of the mycological committee in 1931 handed over, with considerable reluctance, the minute books into which he had poured for twenty-seven years lengthy and vivid accounts of the meetings. (There had been a brief interregnum: John Grainger 1931-6 and George Sheard 1937-8). She gave her own service unstintingly. We were all so conscious of this that in her twenty-first year as secretary we presented her with a carved oak kist (a blanket box) made by a Yorkshire craftsman, together with a book of nearly a hundred signatures. The formal presentation was made at the Spring Foray of 1960 at Holme-upon-Spalding Moor among a good gathering of friends and with an excellent speech by Dr. Douglas Hincks. A few years later, in 1965, her long service to the Mycological Committee was fittingly recognised by appointment as its Chairman.

Meanwhile her lifework, the teaching of young folk, went steadily on. She had a special sympathy with and understanding of young minds and she sought to broaden their interests and to bring out the special gift of each one and to add a love of nature. Her school garden was famous and still continues. She loved beautiful things; hand-craft especially appealed to her and she made herself proficient in different branches.

She will long be remembered for her wide sympathies, for her forbearance, her courage, her wisdom.

E. M. BLACKWELL

BOOK REVIEWS

Welsh Ferns, Clubmosses, Quillworts and Horsetails by **H. A. Hyde** and **A. E. Wade**. Fifth edition revised, expanded and rearranged by **S. G. Harrison**. Pp. xii + 178, with 14 plates and 85 figures. National Museum of Wales, Cardiff. 25/-.

First published in 1940, *Welsh Ferns* quickly established an enviable reputation. Successive editions have clearly shown that, like the Ford Motor Company, the policy of the management 'is one of continuous improvement'. The latest edition is particularly noteworthy for two reasons. Firstly, the original authorship has given way to the present Keeper of Botany in Cardiff. Secondly, the coverage has been widened to include *Lycopodium*, *Selaginella*, *Isoetes*, and *Equisetum*. These new sections of the book, which are most welcome, match the standard of the old. The rest of the text has been revised, not merely by the usual inevitable but depressing changes in nomenclature (e.g. *Dryopteris pseudo-mas* for *D. borrieri*), but also by the addition of *Dryopteris assimilis* and the subspecies of *Asplenium trichomanes*. In all, Mr. Harrison deserves to be congratulated on his achievement in increasing the usefulness of this book while maintaining its high standard.

The title 'Welsh Ferns' has always been a little misleading. Although only Welsh species are illustrated, descriptions of *all* British species are given. In any case, there are not many British pteridophytes which are not found in Wales. This book remains the best available handbook for identification of British ferns. Let any prospective purchaser turn to pp. 85-7 and examine the admirable treatment of the two British species of *Hymenophyllum*, which is unrivalled as an aid for separation of these rather awkward plants. Now extended to cover all pteridophytes, and some fifty pages longer, the value of this book to the naturalist is correspondingly increased, and it is unreservedly recommended to all who want to be able to name these plants.

J.D.L.

The Naturalist on the River Amazons by **Henry Walter Bates**. Pp. xvi + 427. Everyman's Library No. 446. Dent. 16/-.

This welcome reissue of one of the great natural history classics appears in the new format of the Everyman series, with an introduction by Peter Fleming. Bates was one of the greatest traveller-naturalists and collectors. During eleven years spent in the Amazon valley he collected no less than 8,000 species — mostly insects — new to science. His zest for studying the habits of animals of all kinds, for collecting and for observing and recording accurately, information about the country through which he travelled and the people with whom he came in contact were proof against all the privations and hardships entailed by his hazardous journey.

The Naturalist on the River Amazons is a superb and unsurpassed account of tropical natural history, packed full of interest from cover to cover. The simple, direct and undramatised manner of the telling, in a prose 'as durable, as well-proportioned and as polished as a Victorian sideboard' make the impact of his narrative even greater in these days of streamlined expeditions with air-lifts, food drops, radio contact and elaborate medical precautions, than at the time of its first appearance over a century ago. How many travel books of today will continue to be reissued a hundred years hence? Every naturalist should read this book for it has a value which transcends the information which it contains though that alone should fire the imagination and act as a powerful stimulus to enthusiasm.

W.A.S.

The Dolphin, Cousin to Man by **Robert Stenuit**. Pp. 176 with 29 illustrations in colour, 44 in black and white and 10 drawings in text. J. M. Dent & Sons Ltd., London, 1968. 40/-.

In Greek mythology dolphins had once been men and this is the attitude adopted by the author, who is really writing a book about his friends. Stenuit's enthusiasm illustrates the fascination these creatures have always possessed for people associated with the sea; it also disarms criticism of his distinctly fanciful palaeontology and his rather selective approach to the mass of interesting work done on dolphins and their allies in recent years. He brings out well the essentially amiable nature of these animals, their love of play and their astonishingly high degree of intelligence. The last has been a particular surprise since life in the very stable environment of the sea

with, for mammals, much less competition than would be encountered on land, might make one expect a modest level of intelligence, as in manatees, but the truth is quite otherwise and there is now no doubt that the smaller toothed cetaceans at least are very intelligent indeed and perhaps, in their very different way, next to man himself. Apart from such special adaptations as their sonar system, of which he gives a good account, they have an elaborate 'language' for communicating amongst themselves which has led some workers, warmly supported by Stenuit, to hope that a basis of communication with ourselves can eventually be established. However one feels about this possibility, the experiments themselves make entertaining reading and the book is strongly recommended.

T.K.

A Key to the British Fresh- and Brackish-water Gastropods by **T. T. Macan**, illustrated by the late R. Douglas Cooper. Scientific Publication No. 13 of the Freshwater Biological Association, Third Edition, 1969. 4/6d.

This is a reprint of a Key first published twenty years ago to serve students of freshwater biology. In this time there have been some changes in nomenclature which this edition now brings up to date. It has been found necessary to print the revised names at the bottom of the pages instead of alongside the line drawings and this may not be an advantage. Also it might have been reasonable to expand the section on Zonitoides and Succinea since these include waterside examples which may lead to some confusion if the key is used in isolation without supervision.

The Key will be found to be useful wherever freshwater biology is studied but a keen conchological student will rapidly outgrow it.

E.D.

Précis de Lichénologie by **G. Trotet**. Pp. 194, with 45 line drawings, 41 photographs, 3 graphs and 1 map. Editions N. Boubée & Cie., Paris, 1968. 80/-.

The publication of a general text-book of lichenology is not an event which should pass unnoticed, especially when it has been produced as well as this one. This book is intended as a replacement to H. des Abbayes' *Traité de Lichénologie* which was published in 1951. The discussions of the morphology of lichens largely follow that adopted by des Abbayes except that '*Thalles stratifiés-radiales*' replaces '*Thalle composite*' as the name applied to the *Cladonia* type of habit. The choice of examples for the section '*Thalle fruticuleux*' is perhaps unfortunate, both examples having a pendant habit. The photograph (Fig. 14) labelled *Alectoria jubata* is not in fact of that species but probably of *A. fuscescens* Gyeln. A new term, *stereome*, is introduced to apply to the algal-containing layer in *Alectoria* and *Cladonia* between the medulla and the cortex.

Chemical tests are described well but the omission of references to microcrystalline or chromatographic techniques is somewhat unfortunate. The section on the algae of lichens is extremely good and the differences between the lichenised *Trebouxia* and the non-lichenised *Chlorella* are stressed. The discussion on reproduction and the morphology of the ascus is well illustrated but the section on ecology is brief though helpful in that it discusses the nomenclature of lichen communities, something omitted in other recent texts on lichens. The sections on distribution and economics suffer from brevity and the distribution map of *Lecanora conizaeoides* in the British Isles is incomplete and to some extent misleading.

The collection and labelling of specimens is discussed and the author's plea for '*Flores «d'amateur» modernes*' would be echoed by most botanists. A useful key to the families and genera of lichens is provided.

The chapters on physiology, symbiosis, synthesis of lichens, and the especial compounds of lichens are all somewhat outdated. Some discussion of the biochemistry and taxonomic application of lichen substances might have been helpful. It is unfortunate that the bibliography does not extend to 1967 to include the books of Hale and Ahmmadjian published in that year. On page 180 Paulson and Shibata are spelt incorrectly and there are several errors in the index. The omission of the *Bryologist* from the list of journals should be noted.

If this book is to be criticised it should largely be on the grounds of brevity. The numerous photographs and figures should recommend it to teachers at all levels.

D.L.H.

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SOME CHANGES IN BIRD-LIFE IN YORKSHIRE

R. F. DICKENS

The present paper is based on notes made for the joint Y.N.U.-Y.N.T. conference on 'The Changing Face of Yorkshire' at York University in September 1968.

In *British Birds* (1967-1968), John Parslow contributed a valuable series of papers on changes in status among breeding birds. These have proved most helpful. Unlike Parslow, I have not confined my comments solely to breeding species. In addition to his paper, I have consulted *The Birds of Yorkshire* (Nelson, 1907), *Yorkshire Birds* (Chislett, 1952), and annual reports of the Ornithological Section of the Y.N.U. (available only to the 1964 report at the time). Personal impressions as well as direct evidence are included in some instances as a basis for discussion. I hope that in sticking my neck out I shall evoke comment both on those species I have dealt with and those which I have omitted.

Many new species have been added to the county avifauna since 1952 and there have been a number of new breeding records, both regular and sporadic which should all be documented in due course. A number of migrant species have proved themselves to occur with much greater regularity than was formerly supposed. This is partly explained by more concentrated watching at places like Spurn, Teesmouth, Fairburn, etc.; partly it results from more regular habits in watching to meet the needs of B.T.O. enquiries, wildfowl counts and the like. There has also been a vast increase in the numbers of watchers and consequently of records. It is becoming increasingly obvious that to keep abreast of knowledge the 45 year gap which elapsed between Nelson and Chislett's publications is going to be too long for the successor to *Yorkshire Birds*. It is not intended however that this present paper should be considered as bringing *Yorkshire Birds* up-to-date. Implicit in its title is that I am dealing only with *some* changes. I feel that the ornithological section of the Y.N.U. should already be giving some thought to the possibility of a 20 or 25 year rather than a 45 year interval, with a major revision in 1972 or 1977. In the meantime useful surveys could well be made of a number of species. Some which have come immediately to mind I have indicated.

Reverting for one moment to the additions to the county avifauna, I must express disappointment that so many new species have been recorded without adequate reporting in *The Naturalist*. A bald statement in an annual report *may* suffice, for the record, and for the expert, but many of our general members will not appreciate the significance of Dusky Warbler, Petchora Pipit, Song Sparrow, Red-rumped Swallow, etc., and in consequence extreme rarities are on occasion reported as casually as if they were everyday occurrences. Besides setting the record straight more expansive accounts of some of these new species would help to broaden the knowledge of beginners.

DIVERS. In 1952, Chislett commented that there had been no recent equivalent of Nelson's 'at least 50 at sea, flying to S.E. in advance of an approaching storm'. The number of Red-throated Divers breeding in Shetland has shown an increase in recent years and the larger numbers of divers seen off our coast in winter are no doubt partly a reflection of this. Compared with Nelson's 50, we have 223 in eight minutes at Spurn, 330, up to 400, as just a few of recent figures. No doubt such figures are also accounted for partly by changing habits of observing.

GREAT-CRESTED GREBES suffered much from persecution last century. Their come-back has been assisted not only from more enlightened attitudes but also by the creation of man-made habitats. In 1931, H. B. Booth conducted a survey and found 65 pairs on 24 waters. Chislett found them fewer and blamed increased public access and industrialism. In 1946-49 he claimed 90 birds as against Booth's 130. In 1957 a figure of 50 pairs is given and in the following year the species occurred on 30 waters, with breeding on 24 (c.f. 1931) but numbers involved are not given. The 1964 Y.N.U. report provides details for only two out of the five vice-counties with a figure of 34 pairs on 18 waters. *It is clearly time for an all-out effort to carry out a complete census of this species within the county and for this to be written up fully.*

BLACK-NECKED GREBES nested in the county for the first time in 1928 and further nesting and attempts were recorded between 1943 and 1946. Two nests, with five and four eggs were abandoned subsequent to the drainage of Brotherton Ings in 1956.

There is little evidence on which to base a sound estimate of numbers of *LITTLE GREBES* or of population trends, but two things do come out clearly from more recent reports, (a) that the species suffers particularly badly in severe winters, and (b) that flocking occurs in late summer, with peaks quoted of 74, 93, 80 on some waters from early August to October. Nelson talks of immigrants in autumn but the dates suggest post-breeding flocking as a more likely explanation for the above high numbers of a species whose young are often reported as still being fed in mid-September and, in 1964, till mid-October.

In Nelson's time, the *FULMAR* was mainly 'off-shore as an autumn and winter visitor, seldom seen on the coast except as a result of stormy weather'. Fulmars first prospected the Bempton cliffs as recently as 1919 and Scarborough in 1921. The first breeding record for the county was in 1922 — only 46 years ago — yet it is now exceedingly common in suitable areas. There is a somewhat parallel story for *GANNETS*. In 1924 a pair was seen on Bempton cliffs and a nest was made the following year, though it was not until 1937 that it could be definitely claimed that eggs were laid. Only one or two pairs occurred each year until the late forties but eighteen sites were occupied by 1964 and it seems likely that numbers will increase in this only mainland breeding site in Britain and sole colony in England.

CORMORANTS and *SHAGS* would appear to have been subject to some confusion for a time in some areas. There were 24 occupied *Cormorants'* nests in 1964 on the north-east stretch of coast, but the species is less common than it was last century when a number of sites as far south as Flamborough were occupied, with a colony of 50 pairs at Scarborough. *Shags* formerly bred in considerable numbers at Flamborough but by 1907 Nelson wrote 'there is no evidence that it has done so except in isolated instances within the memory of living man'. Chislett (1952) says it occurs on the coast only occasionally but adds that 'one or two people have suspected that birds entering a hollow in the cliffs near Flamborough might be *Shags* not *Cormorants*'. Breeding was proved in 1952 and 1954 and doubtless occurs annually. The highest estimate available has been about 15 pairs. One wonders whether a crash in population may have occurred last century through similar causes to the recent one on the Farnes and again notes the parallel with the current increase in certain other sea-birds.

Both species occur occasionally inland and *Shags* especially seem subject to periodic 'wrecks'. I like the quote from the 1952 Y.N.U. report: 'a first-year bird walked into a workshop near the river at Wakefield — and died'.

HERON numbers have long been known to fluctuate according to the severity of the winters. After a bad set-back there has usually been a recovery within a few years. More recently however, there has been an alarming general decrease in the county of this very fine bird. Where 20 or 30 pairs occurred regularly at Hornsea in the past, only six were present in 1964; and Helaugh's 20 or more were down to eight. None were reported from Harewood or Whitley, each of which had a dozen or so earlier. This decrease has not been due entirely to the exceptional winter of 1962-63 as the trend had been noted earlier. Chislett gave tree-felling, anglers, and photographers as some of the causes, though the problem is probably much more complex. New colonies, founded when birds have been forced away from traditional sites, have not always been located with the thoroughness that was shown in the earlier *Heron* censuses. Unfortunately many of the present generation of bird-watchers devote their time so exclusively to rarity hunting that serious surveys get less than their needful share of attention. Credit is due to Trevor Gunton who has tried to remedy this as far as the *Heron* is concerned.

The *BITERN* was fairly common as a breeding bird up to just over a century ago but became extinct throughout Britain by the mid-1800's. The species has re-established itself in a number of areas. As yet there appears to be no published record of breeding within the county but I think it is justifiable to hope that we shall again have it on the county list of breeding species within a few years.

Ducks — Swans

It is generally accepted that the *TEAL* has decreased but it still nests from high up in the Pennines to near sea-level. Nelson reported *GARGANEY* nesting in the East Riding in the 1880's. The first West Riding breeding occurred in 1926. From both Nelson and Chislett it is apparent that breeding reports were well spaced out in time

and usually only one or two pairs were involved in any one year. Now, although numbers are still low, breeding is regular in several localities and those of us familiar with the species at, say, Fairburn tend to forget that there are probably not more than 100 pairs in Britain in any year. The man-made habitats of the West Riding seem to be to the species' liking.

GADWALL, described by Nelson as a winter visitor of rare occurrence, was becoming more common by 1952 and Chislett concluded that 'it is no longer confined to winter months and it will be no surprise if the species is proved to breed'. My own first acquaintance with Gadwall was in 1947, a year in which there were still only three records for the county. With the species still so uncommon then, I have often wondered whether the record which P. E. Davis and I submitted would have been accepted by Chislett but for the fact that M. F. Meiklejohn had seen the bird independently on the same water. Up to 1948, Chislett was listing every single sighting. To do so now would occupy far too much space, since Gadwalls are regular in many areas, generally in small numbers, and breeding occurs.

WIGEON are breeding regularly in the north of the county and SHOVELER is more widespread than in Nelson's day. Then, TUFTED DUCK was mainly a winter visitor though it nested in one or two localities. Now there are pairs on most waters during the breeding season. Nelson quotes a number of breeding records for POCHARD for last century. It has been regular and flourishing at Hornsea. From my own experience at Fairburn, where Pochard has been as common or commoner than Tufted, I found Parslow's summary ('a scarce breeding bird — about 200 pairs in England and Wales') rather surprising. If he is wrong, we in Yorkshire must take some of the blame. In not one of the Y.N.U. reports for 1961-64 inclusive is there any mention of breeding at Fairburn or Hornsea, the two strongholds of the species. The only reference in those four years is to a new breeding site in V.C. 62. How many of Parslow's 200 pairs could Yorkshire account for I wonder?

I had made notes under EIDER to the effect that there had been a general spread, that records for the county were now more regular and that it might well breed in the county in the foreseeable future. Checking in Nelson for the earlier situation I found that he made almost the same comments and a similar forecast — and that was in 1907!! It is interesting that in 1952, Chislett wrote that it would occasion him no surprise if GOOSANDER attempted to breed in Yorkshire in the fairly near future, but mentioned no such possibility for RED-BREASTED MERGANSER. Yet it is the latter which has bred since 1957 and there is, as far as I know, no published evidence that Goosander is yet a breeding species.

GREY-LAG GEESSE used to breed in the county many years ago and the species has been re-introduced to a number of areas, possibly including some within the county. It will be as well to record any changes in the immediate future in detail and as far as possible to obtain W.A.G.B.I. advice about places, dates and number of introductions. Gadwall numbers *may* be attributable to a similar cause.

Of the two wild swans, WHOOPER SWAN is the more regular though the herds generally tend to be smaller than those for BEWICK'S SWAN. In 'good' years, Bewick's are more numerous than formerly and the largest herds quoted by Chislett (39, 27, 26, 49) are put into the shade almost every winter.

Birds of Prey

BUZZARDS used to breed in Bishopwood, Selby, in Wharfedale, Swaledale, Wensleydale, near Masham, etc., but by Nelson's day had become 'exceedingly rare, having gradually become scarce since the gun came into general use'. Buzzards still nest in small numbers in the north-west of the county where PEREGRINE also still maintains a precarious foothold. I have said before, and I repeat now, how much I deprecate organised club outings to see these vulnerable species in the breeding season.

MARSH, HEN and MONTAGU'S HARRIERS all bred in the county last century. Montagu's was the 'last to leave' and has again bred sporadically especially since the mid-1930's. Hen Harrier has recolonised many areas outside the county and we may well be able to claim it once again as a breeding species soon. The same can be said for these two species as Chislett said of Marsh Harrier — 'If a pair should attempt to breed one year it is to be hoped that they will be allowed to breed in peace, free from the disturbance they so much dislike and may resent to the point of desertion'.

The SPARROW-HAWK is now probably not much less uncommon than the Buzzard and MERLINS also are apparently less numerous than in earlier years. Happily, more recent (verbal) reports indicate some improvement in the position of both, as also a recovery of KESTREL numbers.

Waders

As a breeding species, the OYSTERCATCHER used to be confined in Yorkshire to one or two pairs at Spurn. From 1936 onwards, it has bred inland in the Dales to which it has apparently spread from the west coast. This is a species for which an up-to-date breeding survey is needed and which should not be too difficult to carry out. By contrast, nesting LAPWINGS appear to have decreased, especially since the 1962-63 winter, from which there has been only a slow and partial recovery. Although we now seem to have fewer breeding pairs, my own impression is that we now have more than ever Lapwings during the winter months.

RINGED PLOVERS breed on the coast much less commonly than they used to do, mainly because of the ubiquitous motor-car I suspect. There have been some instances of inland breeding but the Ringed Plover has not exploited these areas to the extent that Oystercatchers have.

It is only 20 years since the LITTLE RINGED PLOVER was first proved to breed in Yorkshire, though it had been suspected of doing so the previous year (1947). Chislett refrained from mentioning any locality for the species, though it is now safe to record that the first instance was at Swillington. There are now something like 30-40 pairs spread over a wide area of the county and in a variety of habitats. In the complex of flashes with nearby colliery spoil-heaps (so favoured by the bird in our county) it would surprise me if a good many pairs are not overlooked. Only this year (1968) I found no fewer than six pairs in an area where they had not been recorded before.

The most recently published annual reports all seem to be pre-occupied with the build-up of winter flocks of GOLDEN PLOVERS to the almost total exclusion of information regarding the breeding status. Fewer ornithologists appear to make a point of walking on the moors these days. If they did, I suspect that they would find Golden Plovers much less common than they used to be. This certainly applies to the one area I know well. Fewer breeding records for DUNLIN are forthcoming, possibly for the same reason. From being a bird mainly of the high moorland areas, the CURLEW has now spread well out on to the lowlands to breed; and some flocks stay inland during the winter months.

The position with regard to passage waders is difficult to interpret in most cases because of annual fluctuations, the variability of suitably attractive feeding areas, and the difficulty of assessing the effects of increased watching. It would seem that some waders, notably GREENSHANK and GREEN SANDPIPER, may be staying on more regularly through the winter. RUFFS may also fall into the same category. The species formerly bred in the county; it has returned to some former haunts elsewhere and more are now being recorded in Yorkshire.

Gulls — Terns

The gulls generally have increased tremendously. A few pairs of both GREAT BLACK-BACKED and HERRING GULLS now nest inland in the north west of the county. The latter are much more numerous on the east coast where, strangely, the LESSER BLACK-BACKED GULL is scarce. They have increased inland however, breeding at Stocks Reservoir and in large numbers in Roeburndale where part of the colony is on the Yorkshire side of the boundary. Many more Lessers also remain with us throughout the winters now.

The COMMON GULL has nested and BLACK-HEADED GULLS have again increased in the past 50-60 years. In 1881, it is said, there was only one station for this species in Yorkshire, though earlier than that there had been large numbers breeding in the lowland parts of eastern Yorkshire. Drainage dispersed most of these earlier colonies (Skipwith is a notable exception) and the build-up this century has resulted from the colonisation of the moorland areas. Surveys of Black-headed Gulls were carried out in 1920 and 1938 and detailed information is available for the locations, sizes and dates of various colonies. There have obviously been changes in the thirty years which have elapsed since the last survey and the time is ripe for the present situation in the county to be detailed once again.

KITTIWAKES were much persecuted on the Bempton cliffs, etc., until the Sea-birds Preservation Act of 1869. The species has increased and colonised new areas this century, e.g. Castle cliff, Scarborough.

It is a matter for regret that we are now virtually without any breeding terns. Occasional reports are given of COMMON TERNS nesting, sometimes inland; and the ARCTIC TERN is said to have bred on occasion. But neither do so regularly. LITTLE TERNS were once the pride of Spurn, of course, but have almost ceased to grace the area. It seems certain that BLACK TERN nested at Fairburn on one occasion in recent times, but unfortunately the sought-for confirmation was not provided.

There has probably not been much over-all long-term change in the status of the owls, though my own impression is that LITTLE OWLS have recently become scarcer. The species didn't really establish itself in Yorkshire until after 1911.

There is little doubt that WOOD PIGEONS have increased. The availability of arable feeding areas in fairly close proximity to the admirable roosting and nesting areas provided in plenty by the Forestry Commission have favoured this species. TURTLE DOVES have gradually extended their range in the county and, of course, COLLARED DOVES, which were totally unknown ten years ago are now not only numerous but widely distributed. The STOCK DOVE is not at all well documented in recent reports and in view of suggestions of a decline elsewhere, I feel we should attempt to establish what its present status in the county is.

Parslow speaks of an increase in GREEN WOODPECKERS, but I feel certain that the recent history of the species in Yorkshire is one of a sharp decline. It received a hard knock from the 1962-63 winter from which it still does not appear to have recovered and is still entirely absent from some of its haunts of 10 years ago.

The RAVEN is still scarce, clinging only precariously to one or two sites in the north west. I would suspect that ROOKS have become fewer, and the same is possibly true also of MAGPIE, though the latter has taken much more to breeding in suburban areas and may in consequence give the impression of being commoner. The MISTLE THRUSH is similar in this respect.

Passerines

When we come to the passerine birds it is generally much more difficult to detect long-term trends. Many of them seem to be subject to periodic fluctuations, with cycles of varying duration between low and peak numbers, quite independent of the effects of severe winters which do, of course, affect many of the non-migratory passerines. Some of those which do migrate may be fewer than usual because of adverse conditions met on their journey in any one year. Many of the passerines are so widespread — though not necessarily abundant — throughout the county that only the most general of comments can be made about them in annual reports and consequently changes in status are not immediately apparent. By providing the necessary yardsticks, some of the more general census surveys organised by the B.T.O. will in some measure help to remedy this for the future. For the above reasons, among others, I propose to mention only a few of the passerines.

It has been stated that there has been a big decline in the numbers of WHEATEARS south of us, but I do not recall any comment to the effect that the species has so far decreased in Yorkshire. In view of the changes further south, it would be a useful exercise for one of the local societies, suitably placed, to establish present distribution and numbers within their area so that any future alteration can be measured. There can be no doubt at all that the STONECHAT has been nothing more than a very casual breeder this century and its apparent increased regularity of late is most welcome. I must confess to a measure of doubt about some of the records of Stonechat nests from about fifteen years ago.

A species which has not received much comment but which in my experience is less common than 15 years ago is the SPOTTED FLYCATCHER. I have heard quite a few people, however, express the opinion that WOOD WARBLERS are fewer, and myself know several areas from which the species has disappeared. This would be a good subject for study within the county, or even within a more limited area. The most dramatic decrease, in my estimation, has been in the status of the CHAFFINCH — 'one of the commonest — perhaps the most numerous of all birds in the county' only 15-20 years ago. The species is still abundant in many areas, but it is not the ubiquitous bird it used to be. Areas in Bucks. which I knew well as a boy and in which

Chaffinches were then abundant, have similarly lost their large numbers and are reduced to odd pairs.

I recall writing to our then recorder for V.C. 63 from that same part of Bucks. several winters ago to the effect that BULLFINCHES were everywhere, being about the commonest bird I had seen on a particular walk. They are now back to a normal level and I suspect that the Bullfinch may be subject to some cyclic variation. The species was said to be coming more common in Yorkshire a few years back. Has the trend continued, I wonder?

The GREENFINCH appears to me to be the outstanding example of a species which has increased over recent years. Perhaps this is an impression engendered by Greenfinches acquiring the habit of visiting suburban gardens and feeding, tit-like, on peanuts. The vast increase in the numbers of people providing food for birds in winter must surely have resulted in better survival and increased numbers of those species which come readily to the bird-table. Along with Greenfinches I think that LINNETS and REDPOLLS have become more numerous and possibly also GOLDFINCHES. That they have done so, if indeed they have, may be partly due to the fact that fewer birds are now caught and caged. The TREE-SPARROW seems to have increased even within the past ten years. DUNNOCK or Hedge Sparrows must surely be about the most frequently seen but least often recognised birds where the general public are concerned, since unobtrusive pairs visit almost every garden. The species is equally common in woodland, along hedgerows and in city parks.

Look — a selection from the BBC-TV natural history series, edited by **Jeffery Roswall**. BBC Publications. 30/-

Warne's Natural History Atlas of Great Britain by **Arnold Darlington**. Frederick Warne and Co. Ltd. 35/-

Field Natural History by **Alfred Leutscher**. G. Bell and Sons Ltd. 60/-

In considering these works together one can link them by the fact that they are all manifestations of current trends in natural history interest. The *Look* series was probably the greatest populariser of wildlife to originate on British television and here is a chance to see again some of its successes. Each chapter covers a different episode, with text by the person responsible for its TV presentation, and all are well illustrated.

Arnold Darlington's *Atlas* will no doubt be appreciated as a companion on country or coast orientated outings, but in fact the maps, with a geological and/or vegetational bias, are sketchy and confined to 14 pages. The preceding 73 pages are illustrated essays on various types of countryside. The illustrations are, in my opinion, too variable to be really useful in a field sense.

The ecological work of Alfred Leutscher is likely to be of service to anyone needing an introduction to the subject and the field work section is commended to teachers and tutors, etc. who may have to set up ecological experiments and surveys. One can easily imagine a natural history novice receiving each of these books in turn and progressing beyond the range of all three in a short time: if this happens all three works will have achieved something.

T.M.C.

Seals by **K. M. Backhouse**. Pp. 96 with 16 colour and 60 black and white photographs. Arthur Barker. 21/-.

Giraffes by **C. A. W. Guggisberg**. Pp. 96 with 16 colour and 60 black and white photographs. Arthur Barker. 21/-.

These are two works in the *World of Animals* series and are thus worth considering together. *Seals*, after briefly considering the world range of the group, dwells mainly on the two British species. The Grey Seal has been the subject of much of Dr. Backhouse's recent research and receives the greatest attention.

Mr. Guggisberg has the advantage in that most of his book is devoted to a single species, with just one chapter dealing with the Okapi, and this gives a better coverage of its subject than the previous one. Both works are very well illustrated and can be recommended, particularly if the reader intends to buy all the works planned for the series.

T.M.C.

SOME OBSERVATIONS ON COPULATION AND ASSOCIATED BEHAVIOUR, AND FOOD SEARCHING OF THE LITTLE OWL

J. B. AND A. E. HAGUE

The observations detailed here were made in 1965 on a pair of Little Owls (*Athene noctua*) which had formed territorial claim about a hollow elm tree, which was one of many forming an avenue on a road running between arable fields, from Cadeby village to Sprotborough village in South Yorkshire.

The tree, which had provided a nest site for the same, or another pair of Little Owls in previous years, consisted of a trunk broken off some fifteen feet from the ground with one large diameter branch broken off a short distance from the trunk. From the top to the junction with this branch, the tree was hollow, as was the branch.

Observations were made on nine occasions, mostly from a car parked within ten yards of the tree. The car was moved closer to the birds when possible, when activity was more distant. Copulation and associated behaviour were observed on three occasions and notes were made on the spot by dictation, as two observers were present. These notes constitute the data set out in this paper, with the addition of notes taken on food searching.

On 30th March at 1900 hours the horn of a passing car disturbed a male Little Owl which flew from the top of the hollow elm tree and alighted on an almost horizontal branch on the next tree. A female appeared and flew to the same tree alighting on a higher branch. The male watched passing traffic and shuffled, fluffed out his feathers and periodically turned his head to one side. She, facing in the opposite direction was also periodically turning her head. She walked along her branch to the trunk of the tree and climbed up it a short distance, in a manner similar to that of a Tree Creeper (*Certhia familiaris*), then returned to her original position. She bobbed her head and several times stretched herself up making her body tall and thin. She flew to a lower branch and settled near the trunk of the tree in a position above the perch of the male. Her head was held forward as if looking hard at the nearby hollow elm tree. He remained hunched with feathers fluffed out, facing in the same direction as she. She then returned to her first perch and looked away for a long period before turning about and looking occasionally at the car. He flew up and alighted beside her remaining for some minutes looking about in all directions. Both birds were preening scapulars and scratching facial discs with their talons. Without any detectable signal she turned horizontally along the branch facing away from the trunk. Immediately the male mounted her back. She crouched slightly and swivelled her tail to one side as he performed a treading action accompanied by wing flapping. His tail was held straight out. During coition, which lasted almost fifteen seconds, a typical unhurried Little Owl "kiew" call was emitted by the male. The female remained silent. Coition was terminated by the male jumping on to the branch ahead of the female, from whence he flew directly away. She returned to the normal cross-branch position fluffing out per feathers. She remained thus for almost five minutes, then stretched up making herself tall and thin several times before flying away in the opposite direction to that taken by the male.

On 2nd April at 1940 hours the male Little Owl was observed perched on a tree stump in a field hedge which was at right angles to the road and thirty yards from the hollow elm tree. He flew to a sappling in the opposite parallel hedge about one hundred and twenty yards from the hollow elm tree. The female appeared, flying low over the ground from a distant part of the field. She alighted on a block of limestone eight yards from the perch of the male. After a short pause she flew to a sappling in the same row as, and fifty yards from, the hollow elm tree. She moved to the next sappling, then into the lower branches of the next elm tree to the hollow one, i.e. the "coition tree" of 30th March. After a short pause she flew to a stump in the hedge where the male had first been observed. He flew from his perch momentarily alighting on the ground in the centre of the field, then flew to another stump just ahead of the female. She flew and alighted on the ground at the foot of an elm tree in the same hedge and was quickly joined by the male. They faced each other and appeared to touch bills, this could have been a food pass. Immediately, he flew to the centre of the field and alighted and she flew up into an elm tree which was about fifty yards from the hollow elm tree. She was joined by the male who flew to a higher branch. She then flew up and alighted on the same branch as him but a little below. She walked up the branch towards him with a wing fluttering soliciting action. He mounted, standing on her head and facing

her tail, but quickly changed to the normal position adopted during coition. She was standing in a horizontal position along the branch, facing away from the trunk. During coition the male stopped his treading action and rested, then began again with a gentle wing flapping. Coition lasted approximately ten seconds, during which time a constant "kiew vi kiew" call was heard, but it was not possible to determine which bird was calling. Coition was terminated by the action of the female flying from under the male and alighting on a lower branch, but the calling continued. She turned and looked up at the male, then flew up to and around him and back to her perch, twice. He then flew down and mounted her and coition took place for approximately twenty seconds. The female was perched across the branch during coition. During this period he rested six times, remaining on her back. Coition was terminated when they each moved to separate branches. She preened and then flew up to the next branch, he followed and as she turned along the branch he mounted her again. Coition lasted about five seconds before he alighted beside her. The "kiew" call was repeated and he again mounted and coition lasted for two or three seconds. Immediately afterwards she flew away passing close by the hollow elm tree. The male was not observed leaving.

On 7th April at 1940 hours the male Little Owl was observed in an elm tree forty yards from the hollow tree. He flew across the road into the top branches of another tree. After pausing, he flew to the next tree and then to the next, which was almost opposite the hollow elm tree, some nine yards away. He was joined almost immediately by the female who appeared from behind the hollow tree. She performed a neck-stretching display three times whilst looking directly down at the car, then jumped over the male and flew to a slightly higher branch. He flew up to a branch of equal height about three yards from her. Both birds began preening. He then flew and alighted beside the female giving a single "kiew" call. She continued to preen and he also began to preen. She moved a short distance away from him along the branch but he immediately moved up alongside her and mounted her with his wings gently flapping, she sitting across the branch. Coition lasted almost twelve seconds. The male repeatedly gave a call which can be described as "tchoock tchook tchook tcheroo". The female gave a high-pitched call of "scee scee squee", not unlike that of a juvenile House Sparrow (*Passer domesticus*), soliciting food. On termination of coition the male flew directly to another elm tree, then away out of sight. After a short pause the female flew away in a direction almost opposite to that of the male.

Later in the year nestling Little Owls were observed in the hollow elm tree and were accepted as proof of successful breeding.

FOOD SEARCHING BEHAVIOUR

On 30th March at about 20.00 hours, a Little Owl was observed on the ground about five yards from a hedge in a newly-set field. A second Little Owl flew low over the hedge and alighted some yards ahead of the first owl, which appeared to be searching the ground as it walked forward between occasional halts. The second owl then flew back over the first, turning almost at the hedge, then flying a reciprocal course, alighted on almost the same spot. Both owls then continued slowly walking forward, giving the impression of searching, but were not observed to take food. Observations were made difficult by failing light.

On 1st April at 20.05 hours a Little Owl was observed to leave a perch and swoop into a newly-set field, where it alighted on the ground and began walking slowly forward apparently searching for food. A second owl flew out of the dusk and passed low over the first owl, alighting at just the limit of vision. The first owl immediately flew low over the ground and over the head of the second owl and was lost to sight. The field was a different one from that of 30th April.

On 6th April at 20.10 hours a Little Owl was observed on the ground in a newly-set field. It was walking forward apparently searching the ground and occasionally moving some distance with its wings raised and flapping as if to assist in more rapid movement in pursuit of moving prey.

On 12th May an adult Little Owl was observed leaving the hollow elm tree. It alighted on the ground amongst a growing crop. The bird was observed progressing across the ground in a series of hops and short flights punctuated by periods of rest in an apparent search for food. A second owl flew low over the first owl and alighted in the next field. The first owl immediately followed the second, both eventually moving out of sight.

MAMMALS OF GIBRALTAR POINT NATURE RESERVE, LINCOLNSHIRE, 1966-68

T. M. CLEGG

City Museums and Art Gallery, Dundee

During the period 1966-68 I collected small mammals and made observations on the Gibraltar Point sand dune system, as part of a wider study on the small mammal faunas of sand dunes and similar habitats. These notes cover certain aspects of this work and also form a check-list of the mammals encountered, though not necessarily collected, during this period. A number of earlier records are included to complete certain sections of the faunal list. Conditions at Gibraltar Point offer interesting comparisons to those which occur on the Spurn Peninsula, some 45 miles to the north, but the structure of Gibraltar Point is so different from the point of view of mammal colonisation that a brief account of the terrain is given here.

STUDY AREA AND METHODS OF INVESTIGATION

The Field Research Station at Gibraltar Point lies about four miles south of Skegness on the northern tip of the Wash. The reserve consists of two lines of dunes, approximately half a mile apart at their southern extremities, but converging at their northern ends, with marshland occupying the area between them. The dunes are thickly covered with Sea Buckthorn, Elder, etc. towards their northern ends and dense cover of this type covers the area where they converge. The dune lines consist of an old (western) and new (eastern) set of dunes, the former representing the shore line of about 200 years ago, the latter being about 80 years old and still developing eastwards. The marsh, which extends from the Buckthorn - Elder scrub to the shore of the Wash, is freshwater at the northern end but becomes progressively saltier as it extends southwards. The buildings explored consist of the Research Station, now mammal-pest free, and the Bird Observatory buildings on the eastern dunes near the Wash shore. A road backed by arable land forms a large part of the western boundary of the reserve, as does the tidal creek of the River Steeping. Between the creek and the road there is an abandoned farm with a well timbered but overgrown garden area. At least half of the reserve boundary lies along a land border, and this is one of the major differences between this reserve and Spurn, where the colonisation corridor is comparatively narrow.

On each visit thirty to fifty breakback traps were used, and the setting of these was to the following general pattern. Traps were laid in sets of three, with a distance of about three feet between each trap, and in each area under investigation five sets of traps were normally used with a distance of about thirty feet between each set. Naturally, this arrangement depended upon the terrain, and in the less vegetated areas or the public car park, smaller numbers of traps were set at points where results were considered likely. All traps were baited with cheese and were covered with grass where mammal runs were not available. The total catch was low in proportion to the number of trap/nights, but this was expected in view of the pattern of trap setting.

In addition to the animals trapped, a certain number were found dead, killed as pests, or occurred as skeletal material in owl pellets. Short-eared Owls (*Asio flammeus*) were frequently seen and their pellets, as well as sight records of the preys taken by them, contributed to the data collected. The numbers of small mammals prepared for study purposes as skins was as follows: *Sorex araneus* 51, *Sorex minutus* 29, *Neomys fodiens* 1 (earlier record), *Clethrionomys glareolus* 6, *Microtus agrestis* 2, *Apodemus sylvaticus* 24, *Mus musculus* 5 (anti-pest campaigns). Apart from those whose sources are indicated, the rest were caught during the investigation as described above.

The following list summarises the mammal species encountered at Gibraltar Point and includes some data on species which were not collected as detailed above.

SYSTEMATIC LIST

INSECTIVORA

Hedgehog (*Erinaceus europaeus*). Fairly common, particularly in the well vegetated parts of the West Dunes.

Mole (*Talpa europaea*). Widespread, wherever suitable soil for burrowing occurred. The rabbit-proof plantation near the abandoned farm and the thickly vegetated western dunes appeared to be favoured areas.

Common Shrew (*Sorex araneus*). The most frequently trapped species. Found in all habitat conditions including the slightly raised banks of the marsh, which was subject to periodic flooding. Adults of this species in summer pelage were conspicuously tri-coloured, closely matching specimens from Spurn Point in East Yorkshire, Cley in Norfolk and other coastal localities.

Pigmy Shrew (*Sorex minutus*). Present in all habitat conditions, with a tendency to be more common on the more sparsely vegetated East Dunes and on the maritime grassland around the Field Station. On the sample trapped, 29 *S. minutus* in a total of 80 *Sorex* species, the percentage of *minutus* in the population would be about 36%. This is very close to the 35% mentioned by Southern (1964) as recorded from dunes in Germany. During the Gibraltar Point study, analysis of mammal remains from discarded bottles in the dunes and comparison of these with trapping results indicated a similar level of abundance for *minutus*. In this note (Clegg, 1966), I gave details of the traps used and these and subsequent results strengthened my view that careful setting can eradicate any bias against the trapping of lightweight animals.

Water Shrew (*Neomys fodiens*). The only record is of an adult found dead, in September 1964, on the sandy spit which projects southwards from the East Dunes into the Wash. This shrew which was freshly dead when found, was prepared as a study skin by Mr. C. J. Devlin and deposited in the collection of Doncaster Museum.

CHIROPTERA

No bats were caught during the period under review, although small numbers were seen around the Field Centre, particularly during the period 10th-15th September 1967. From observations it appeared likely that two species were present, probable Pipistrelles and possibly one of the small *Myotis* species.

LAGOMORPHA

Rabbit (*Oryctolagus cuniculus*). Widespread and often abundant. Sandy and black mutants were frequent and white-marked individuals not uncommon.

Brown Hare (*Lepus europaeus*). Fairly common, particularly on the arable land to the west of the reserve.

RODENTIA

Bank Vole (*Clethrionomys glareolus*). Of those trapped, all were on the West Dunes apart from one from the East Dunes. It would appear likely that these results might be a true reflection of the species' distribution and that the more densely vegetated West Dunes were favoured to a greater extent. The apparent scarcity of this species at Gibraltar Point was in contrast to its status at Spurn, where it was common in similar habitat conditions (Clegg, 1965).

Short-tailed Vole (*Microtus agrestis*). Only two were trapped, in the raised banks of the River Steeping. However, the species was apparently common in the marsh section, judging by the consistently successful hunting of Short-eared Owls there, and by the number found dead in September 1967 following one of the periodic incursions of the sea during the high spring tides.

Water Vole (*Arvicola terrestris*). Restricted to the northern, freshwater section of the central marsh, where it did not appear to be numerous.

Wood Mouse (*Apodemus sylvaticus*). Found in all but the marshier sections of the area. Abundant on the East Dunes, where burrows were found on the seaward slope which supported the scantiest of vegetation. The Bird Observatory and associated buildings had a high population at times.

Yellow-necked Mouse (*Apodemus flavicollis*). This species was not encountered during the period of my investigation, though Mr. A. Lodge, the reserve warden, and others, stated that it had formerly occurred. Specimens appear to have been taken in the Field Centre, on the west side of the reserve and in the Bird Observatory, on the eastern dunes, but none were preserved.

House Mouse (*Mus musculus*). Specimens were received from the Field Centre during the early stages of the project, but this population later succumbed to the general increase in hygiene and had not recolonised the area by 1968. None were found out of doors, but the species had been present in the abandoned farmstead some years previously.

Brown Rat (*Rattus norvegicus*). Only encountered casually, on the road along the western side of the reserve.

CARNIVORA

Fox (*Vulpes vulpes*). Frequently seen and apparently quite common. Whilst their predation of Rabbits was regarded as beneficial, some losses of young in the Little Tern (*Sterna albifrons*) colony were ascribed to this species.

Stoat (*Mustela erminea*). Seen occasionally, but my impression was of a low level of population over the whole area.

Weasel (*Mustela nivalis*). Apparently relatively scarce. Another contrast between Gibraltar Point and the Spurn Peninsula was the comparative infrequency of mustelid sightings. Whilst this may reflect the difference between a larger, more vegetated area, and a narrow peninsula, it is possible that they may have been generally less common.

Common Seal (*Phoca vitulina*). Fairly numerous on all visits, with over 60 at times on offshore sand banks. This area is a well-known breeding ground of the species.

SUMMARY

This paper summarises the mammal species recorded on the Gibraltar Point Nature Reserve, Skegness, Lincolnshire, during the period 1966-68. Visits were made to the area at the following times: 12th-16th March 1966, 8th-12th May 1966, 9th-12th April 1967 and 10th-15th January 1967 and specimens were received from correspondents in the area up to June 1968. The mammal specimens collected were used as comparative material in wider studies on sand dune mammal faunas. Comparisons are made between Gibraltar Point and the Spurn Peninsula in Yorkshire, some 45 miles to the north.

ACKNOWLEDGEMENTS

During most of this period I was in receipt of a Leverhulme Research Grant, for which grateful acknowledgement is made to the Trustees. On all visits to Gibraltar Point and over the whole period, I received assistance from Mr. A. Lodge and Mr. R. B. Wilkinson. The Lincolnshire Trust for Nature Conservation, and Mr. A. E. Smith in particular, offered every facility during the period. My wife, as usual, assisted with the preparation of mammal skins.

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THE SAND LIZARD IN NORTHWEST BRITAIN

C. SIMMS

INTRODUCTION AND ACKNOWLEDGMENTS

This paper attempts to describe the known distribution and establish the present status of the Sand Lizard *Lacerta agilis* L. in northwestern Britain, based on review of the literature and investigation in the field between 1962 and 1968. Only the more important sources are indicated in the list of references and not all correspondents and others who have helped in the fieldwork from 1962 to 1968 can be individually acknowledged here. The author is grateful to the many naturalists who have contributed verbal or written reports, field-sketches, photographs and specimens. These items and detailed comment which cannot be included here, will be deposited at the Yorkshire Museum, York, or some other institution where their preservation can be assured, when the author himself moves on; until then they are available on application. Preserved specimens, which with data are the most valuable records of all, are already incorporated into the collections at the Yorkshire Museum, except where otherwise stated.

The work was guided by R. Wagstaffe of Liverpool Museums. J. Baker, R. Beel, A. Brown, D. Proctor J. and W. R. Skeels helped with fieldwork. Without exception, the secretaries of the southwest Lancashire chain of "links" golf clubs granted permission to visit their properties, whilst the North Wales and North of England regional officers of the Nature Conservancy (Natural Environment Research Council) also supplied permits to visit and search reserves in their care. Miss A. G. C. Grandison

and R. J. Knowles helped at the British Museum (Natural History); other museum help came especially from Mrs. C. Clarke (*née* Bracegirdle) and Dr. L. S. Garrad at Douglas, Mrs. H. Wood (*née* Forsyth) at Chester, and Mr. J. R. Rimmer at Warrington.

For the purposes of this account "reports" mean unpublished and "records" published references to "Sand Lizards", "sand-lizards", "*Lacerta agilis*", or these synonyms of this species known to have been used in the British literature:

- 1758 *Lacerta agilis* Linnaeus, partim. Syst. Nat., Ed. 10, 203.
- 1768 *Seps caerulescens* Laurentus, Synops. Rept.: Fig. 3.
- 1802 *Lacerta stirpium* Daudin, Hist. nat. Rept.: 3, 155 (*L. sterpium* auct.).
- 1804 *Lacerta anguiformis* Sheppard, Trans. linn. Soc., London, 71, 51.

There has been much confusion, in the field and in the literature, over the diagnostic characters of the Sand Lizard; a situation which is reflected in the fact that there are at present at least two major provincial museums showing specimens of the Viviparous or Common Lizard *Lacerta vivipara* Jacquin labelled 'Sand Lizard'. There can be little wonder that many naturalists, including some with a great deal of experience of vertebrates, have repeatedly made mistakes. When features diagnostic for specimens in the hand are not agreed by various authorities in the available literature how can so-called "field characters" be expected to be reliable? So often our reptiles give only a fleeting glimpse, and so it is hardly surprising that so few amateur or professional zoologists in this country are sufficiently familiar with them to name them at a glance with any confidence. Our unfamiliarity with them works against their conservation. The informed public at large, and the nature conservation bodies in particular, are not aware of the increasingly critical status of some of our few species of herpetofauna and of the Sand Lizard in particular. The species is known to occur in only a very few dune and lowland heath localities; and all of these are habitats threatened with destruction today.

The satisfactory determination of the species of Lacertid lizards is, even in this country, not straightforward. There are introductions, attempted introductions, escapes and hoaxes involving several continental species; and so the whole genus must be considered when a given lizard is examined. The best, comprehensive key to *Lacerta* is that of Mertens and Wermuth (1960); a partly-plagiarised and simplified version in English is in the press and it is not proposed to repeat it or reduce it here. The accurate naming of lizards depends, not on habitat or on coloration or on markings, but on structure and particularly on details of scale pattern. Only examined, preserved or living specimens from trusted sources support the records accepted here; nearly all these have been seen by the author. The presence or absence of lizards in a given area is not difficult to establish if there are opportunities for repeated visits in the most favourable months — usually May and September. Finding lizards is one thing, watching or catching them to discover which species are represented is another.

SOUTHWEST SCOTLAND

Leighton (1903, 57) mentions a report from Ayrshire which he did not accept. No reports have come to the author's notice.

NORTHWEST ENGLAND

Coward (1901) reviewed the known status of the species in the North of England in a masterly paper which first brought Northern populations of the Sand Lizard to general notice.

CUMBERLAND

No reports have reached the author, and none were known to Coward, Leighton, or Taylor (1963). On South Solwayside, the Drigg Peninsula, and elsewhere there is terrain similar to that used by the species elsewhere in Britain; and the present author has worked those localities rather little. R. F. Mash (*in litt.*, 1962) had not seen or heard of Sand Lizards on the Drigg Peninsula.

WESTMORLAND

No reports are known to the author.

LANCASHIRE

There are two districts with suitable terrain, each with records. These are dunes and dune heath; at Walney Island and neighbouring localities in the north, and

between Southport and Liverpool (Crosby) in the south. Possible former occurrence in the north rests on the authority of Johnstone (1906); no specimens are known. The present author has seen only *L. vivipara* there. Further unconfirmed reports from near Lytham early in 1965 (J. Baker, *pers. comm.*) were satisfactorily referred to *L. vivipara* when the author visited him.

In the south the coastal system of sand dunes, up to two-and-a-half miles wide, still constitutes the best-known Northern station for the species. Verifiable records go back to about 1856, and perhaps earlier. Destruction of the habitat has restricted the species to several rather insecure stations near Southport and Formby, some of them within built-up areas. The total dune population was estimated in 1964 at some 400 individuals (Simms, 1966). Inland there are other sandy localities in South Lancashire and R. Beel caught one of two Sand Lizards seen in 1962 on mossland at Simonswood, now being built over. Subsequent search by the author revealed another in 1966, and this was a juvenile individual indicating successful breeding in that year.

The isolation of some of the Lancashire stations from one another, and some of this must be upwards of a hundred year's antiquity, argues against the recent introduction of the species into Lancashire.

CHESHIRE

That the Sand Lizard used to occur on the Wallasey-Hoylake Wirral dunes is on the authority of several reliable naturalists including H. O. Forbes, L. Greening and R. K. Perry. Specimens critically examined by other herpetologists are attributed to Greening and C. S. Gregson, but these cannot be traced today. The most recent record, acceptable to N. F. Ellison (1959) and R. Wagstaffe (*pers. comm.*) is from c. 1933. The present author examined suitable terrain on the Wirral Peninsula in 1964, 1965 and 1966 with no success.

NORTHWEST WALES

The former presence of the Sand Lizard here rests upon the authority of H. E. Forrest (1907) or his correspondents. The validity of those reports cannot be proved today.

ANGLESEY

In 1961 A. J. Mercer (*pers. comm.*) described "Sand Lizards" seen at Newborough Warren. His drawings suggested *L. vivipara*, greenish individuals of which were found to be frequent there during the author's visits in 1963 and 1965.

MERIONETH

Forrest (1941) records the species from Llwyngwrl in 1934 and near Aberdovey in 1935, but these reports remain unsubstantiated. In 1965 and 1966 came reports from the Morfa Harlech and Morfa Dyffryn dunes by D. Proctor (*in litt.* and *pers. comm.*). His drawings did not show any diagnostic *L. agilis* features. A specimen taken by another naturalist in 1965 proved to be *L. vivipara* (*fide* Mrs. H. Wood), a species found to be abundant in both localities by the author.

DENBIGH (and part of CAERNARVON)

Forrest (1907) accepted P. Inghald's report (1860), which pre-dates the time when the diagnostic characters of British lizards became well-known. Forrest (*op. cit.*) considered it doubtful that the species still existed there. No further reports are known to the author.

FLINT

Prestatyn and the Point of Air, 1914, are Forrest (*Handbook of the Vertebrate fauna of North Wales*, n.d.) records which cannot be assessed today. Sand Lizards cannot be found there now, but there has been destruction of potential habitat.

ISLE OF MAN

No report of the presence of Sand Lizards in the Isle of Man is authenticated. Reports prior to about 1953 were reviewed by D. E. Allen and W. S. Cowin (1954) who were inclined to accept them despite R. Wagstaffe's note of caution in an editorial footnote to their paper. Early reports seem to originate with J. Train (no date, but prior to 1842) and were fostered by E. Forbes (1839). Since 1954 there have been further reports which have not been critically examined until now. Miss M. Quayle and E. Howarth separately reported the species from different localities, but without supporting evidence. In September 1962 the author showed Miss Quayle a rather green *L. vivipara* taken in her "Sand Lizard" locality (York Museum, 1966z99) and she declared it to be 'identical' to the specimen she had decided was a Sand Lizard after consulting M. Smith's work (1954). Another Ramsey school-teacher showed a preserved 'Manx Sand Lizard' which was also *L. vivipara*. The author searched lizard ground on Man on several occasions in 1962-4 but found only the Viviparous species. Enquiries at the Manx Museum revealed other erroneous recent records from Man. Although specimens labelled "Sand Lizard" have been lost (Mrs. C. Clarke, *in litt.*), photographs by H. Rogers labelled "Sand Lizard" were of *L. vivipara*. In 1959 Miss A. G. C. Grandison of the British Museum (Nat. Hist.) determined a presumed Sand Lizard as *L. vivipara*, for Miss Quayle (*L. S. Garrad, in litt.*).

SUMMARY

Records of the Sand Lizard *Lacerta agilis* L. substantiated by known specimens extant today have been received only from Southwest Lancashire, in Northwest Britain. Work is at present proceeding on the status of the species in Northeast England (Lincolnshire to Northumberland) and the author would be grateful for reports, references and information on the present whereabouts of any specimens.

The present author considers that the species has occurred in Cheshire (Wirral Peninsula) and may still be there, but he considers the reports from other districts referable to the Common or Viviparous Lizard *Lacerta vivipara* Jacquin wherever these have been critically examined.

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 No date, but prior to 1842.

THE LEPIDOPTERA OF YORKSHIRE

(continued from p. 100)

Dyscia fagaria Thunb. (Grey Scalloped Bar).

Widely distributed over the moorland areas; although generally reported from the low-lying heaths there are several records for the higher moors.

61. Skipwith Common.

62. Strensall Common.

63. Bingley, St. Ives; Little Horton near Bradford; Hawskworth Moor, 1952; Skelmanthorpe, at Rusby Piece in 1911; Thorne Moor.

64. Ilkley Moor, 24th June 1950.

Gnophos obscurata Schiff. (Annulet).

Very local and now only recorded with any regularity on the coast in the Filey area.

61. Filey, frequently taken on the coast.

62. Pickering, in Gundale in 1963; Saltburn, 1915.

64. Grassington, Dib Scar up to 1918 and in 1956.

Bapta bimaculata Fabr. (White Pinion Spotted).

Not recorded since Porritt's List.

B. temerata Hubn. (Clouded Silver).

Very local but quite widely distributed.

62. Hackness, one larva in 1968; Pickering, in Gundale; Scarborough, larvae frequent in Raincliffe Woods, 1967.

63. Edlington Wood; Bradford district, 1968.

64. Bishop Wood; Harrogate.

Cabera pusaria Linn. (Common White Wave).

Generally distributed and often common.

C. exanthemata Scop. (Common Wave).

Also widely distributed but more local and rather less common than the previous species.

Ellopiia fasciaria Linn. (Barred Red).

Widely distributed but rather local, presumably being restricted by the availability of Pine.

62. Hackness; Strensall Common.

63. Sheffield.

64. Bishop Wood; Harrogate; Hubberholme, 1910; Knaresborough.

Campaea margaritata Linn. (Light Emerald).

Generally distributed and often common in wooded areas.

Angerona prunaria Linn. (Orange Moth).

Not recorded since Porritt's List.

Semiothisa alternaria Hubn. (Sharp-angled Peacock).

This species was added to the Yorkshire list when H. N. Michaelis took a single specimen at Kilnsea Warren (61) in 1949. This remains the only record. It is assumed that it must have bred on the Sea Buckthorn which grows there so extensively but repeated working of the area has failed to reveal any further evidence of it.

S. liturata Clerck (Tawny-barred Angle).

Well distributed in pine woods, the melanic form *ab. nigrofulvata* has been recorded from Bishop Wood and Deffer Wood.

61. Skipwith Common.

62. Thornton-le-Dale.

63. Deffer Wood; Thorne Moor, 1909; Walton near Wakefield; Wyke.

64. Bishop Wood; Gateforth; Grass Wood, 1930; Harrogate.

Isurgia carbonaria Clerck (Netted Mountain Moth).

Not recorded since Porritt's List.

Itame wauaria Linn. (V-moth).

Not as common as formerly, perhaps due to a change in gardening methods. It is however, still widely distributed in gardens of well-established gooseberries and currants. The only record away from such cultivation is from Grass Wood (64).

Chiasmia clathrata Linn. (Latticed Heath).

Local in dry places but often common especially on the coast.

61. Spurn.

62. Burniston, common on the undercliffs; Robin Hood's Bay; Scarborough.

64. Drax; Malham, 1967; Michlefield; Selby area, on railway banks.

65. Constable Burton, common in 1960.

Theria rupicaprararia Hubn. (Early Moth).

Often common on hedges but not recorded from some well-worked areas.

61. Selby area.

63. Doncaster; Huddersfield; Skelmanthorpe, 1921; Snaith.

64. Askham Bog; Copmanthorpe; Harrogate; Selby area.

Erannia aurantiaria Esp. (Scarce Umber).

This moth is by no means scarce, it is widely distributed particularly among Birch; a melanic form has been recorded from Elland (63).

E. marginaria Borkh. (Dotted Border)

Generally distributed and often common.

E. leucophaearia Schiff. (Spring Usher).

Well distributed in oak woods, many different varieties have been recorded.

61. Escrick.

63. Calverley; Chevet; Deffer Wood; Doncaster; Shipley Glen; Skelmanthorpe.

64. Bishop Wood; Brayton Barff; Copmanthorpe; Selby area.

E. defoliaria Clerck (Mottled Umber).

Generally distributed and often common, but it has not recently reached the numbers of former years when the trees were literally defoliated.

Anagoga pulveraria Linn. (Barred Umber).

Now very local in the County and usually scarce.

62. Gundale near Pickering; Scarborough, 30th May, 1968.

63. Edlington Wood, 1917.

64. Bishop Wood; Knaresborough, in Birkham Wood in 1962; Winterburn near Skipton in 1932

Plagodis dolabraria Linn. (Scorched Wing).

Widely distributed and frequently taken in small numbers.

61. Skipwith Common.

62. Hackness; Strensall Common; York.

64. Bishop Wood; Harrogate; Knaresborough; Kirkstall, 1956; Grassington, 1930; Scholes near Leeds.

Ennomos quercinaria Hufn. (August Thorn).

Very local and now occurs regularly in only one locality.

61. Filey, one at Muston in 1968; Everingham, 1923.

62. Pickering, frequently in Gundale.

64. Harrogate, one in 1946.

Deuteronomus alniaria Linn. (Canary-shouldered Thorn).

Well distributed in the County and frequently recorded over a wide range.

D. fuscantaria Haw. (Dusky Thorn).

Also widely distributed but generally less common than the previous species.

61. Barby, sometimes common at light; Burton Agnes, 1967; Muston near Filey, 1968.

62. Ampleforth, 1968; Pickering; Strensall.

63. Wath-on-Dearne; Wakefield, 1958.

64. Askham Bog; Bishop Wood; Gledhow; Harrogate; Kirkstall; Knaresborough, 1959; Selby.

D. erosaria Borkh. (September Thorn).

Widely distributed and frequently recorded though usually in small numbers.

61. Barby; Selby; Skipwith Common.

62. Ampleforth, 1968; Strensall Common.

63. Halifax.

64. Bishop Wood; Brayton Barff; Harrogate; Scholes, 1968; Selby district.

Selenia bilunaria Esp. (Early Thorn).

Well distributed and often common. Melanic forms have been taken from Bishop Wood (64) and Doncaster (63).

S. lunaria Schiff. (Lunar Thorn).

Well distributed but seldom common.

62. Guisborough; Pickering, in Gundale.

63. Barnsley; Denby Dale, 1906; Skelmanthorpe, 1908.

64. Bolton Abbey, 1937; Denton Moors; Grassington, one larva in 1967; Harrogate; Knaresborough; Selby, 1934.

Apeira syringaria Linn. (Lilac Beauty).

Not often recorded but evidently fairly well distributed in the central part of the County.

61. Barlby; Skipwith Common.

64. Bishop Wood; Harrogate; Knaresborough; York district.

Gonodontis bidentata Clerk (Scalloped Hazel).

Widely distributed and often common. Melanic forms occur quite commonly in some areas.

Crocallis elinguaris Linn. (Scalloped Oak).

Widely distributed and sometimes common.

Colotois pennaria Linn. (Feathered Thorn).

Widely distributed and often common in well-wooded areas.

Opisthograptis luteolata Linn. (Brimstone).

Generally distributed and often common.

Cepphis advenaria Hubn. (Little Thorn).

The only known locality in the County is Edlington Wood (63) where it was common at the turn of the century. The only recent record was of a solitary female taken there on 14th June, 1958, from whose ova a short series was bred.

Epione vespertaria Thunb. (Dark Bordered Beauty).

The only known locality in Yorkshire, and certainly the best known locality in Britain if not the only one, is Strensall Common (62). In spite of frequent fires and regular visits by numerous collectors it continues to flourish there and over 20 were recorded (but not taken) during a recent Y.N.U. visit.

E. repandaria Hufn. (Bordered Beauty).

Local and seldom seen in any numbers but evidently fairly widely distributed.

61. Barlby, 1968; Skipwith Common.

62. Runswick Bay, 1959; Scarborough, 1967; Strensall Common.

63. Haw Park near Wakefield, 1911.

64. Askham Bog, common; Bishop Wood; Haddlesey near Selby.

Pseudopanthera macularia Linn. (Speckled Yellow).

Apart from a very old record from Malham (64) the only known locality is Grass Wood (64) where it still occurs and is often plentiful.

Lithina chlorosata Scop. (Brown Silver Lines).

Widely distributed and usually common where there is plenty of bracken.

Ourapteryx sambucaria Linn. (Swallow-tail).

Generally distributed and sometimes quite common both in built-up areas and in wooded districts, or wherever there is either Ivy or Elder.

Phigalia pedaria Fabr. (Pale Brindled Beauty).

Generally distributed and often common. The melanic form usually outnumbers the type.

Apocheima hispidaria Fabr. (Small Brindled Beauty).

Uncommon and seldom recorded. The best known locality in Yorkshire is Bishop Wood (64), but even there there was a gap of over fifty years before it was taken in 1966.

62. Great Ayton, rare before 1918; Strensall Common, one pupa dug on 17th September, 1959, and a male bred on 14th March, 1960.

63. Sheffield, once.

64. Bishop Wood, one on 5th March, 1966, two 18th March, 1966, and several in 1968.

Lycia hirtaria Clerck (Brindled Beauty).

What appears to be the last authentic record of this moth in Yorkshire is from Raincliffe Woods, Scarborough (62) in April, 1902.

Biston strataria Hufn. (Oak Beauty).

Widely distributed but not often common.

62. Buttercrambe Woods, 1933; Scarborough, 1900.

63. Deffer Wood, 1917; Doncaster.

64. Bishop Wood; Burley Woodhead, 1960; Brayton; Cambelsforth; Copmanthorpe; Gateforth; Harrogate; Knaresborough.

B. betularia Linn. (Peppered).

Generally distributed and often common. The type is rare in the County; the genetically dominant melanic form probably accounts for over 95% of the specimens recorded.

Hemerophila abruptaria Thunb. (Waved Umber).

Now scarce and local with only three recent records, all from the Eastern part of the County.

61. Hornsea Mere, April, 1912; Skipwith Common, one, 22nd May, 1960.

62. Pickering, one in Gundale, 18th May, 1964; Scarborough district, one in 1967; York, formerly in Bootham.

Boarmia roboraria Schiff. (Great Oak Beauty).

Not recorded since Porritt's List.

Cleora lichenaria Hufn. (Brussels lace).

Only recorded once since Porritt's List, from Raincliffe Woods near Scarborough (62) in the early part of the century.

C. rhomboidaria Schiff. (Willow Beauty).

Generally distributed and often common, even in built-up areas.

C. repandata Linn. (Mottled Beauty).

Widely distributed and often common; it shows a wide range of variation, both black and banded forms being taken.

Ectropis bistortata Goeze (Engrailed).

Fairly well distributed except in the more industrial areas; often common in large woods in the Spring.

E. crepuscularia Hubn. (Small Engrailed).

This is difficult to distinguish from the previous species and may also occur over a wide range; on the basis of the dates there are two records which seem reliable.

62. Kirby Moorside, 16th to 18th May, 1959.

64. Harrogate, 25th May, 1960 and subsequently bred from larvae feeding on larch.

E. consonaria Hubn. (Square-spot).

Not recorded since Porritt's List.

Aethalura punctulata Schiff. (Grey Birch).

Local but often common where it occurs.

61. Skipwith Common; Selby district.

62. Strensall Common.

64. Askham Bog; Bishop Wood; Ripon, at Queen Mary's Dubbs, 25th June, 1954; Selby district.

Ematurga atomaria Linn. (Common Heath).

Generally common on heathland throughout the County.

Bupalus piniaria Linn. (Bordered White).

Generally distributed throughout the pine-woods of the County and often very common therein. It is also taken sporadically in garden areas where odd pine trees grow.

ZYGAENIDAE

Zygaena filipendulae Linn. (Six-spot Burnet).

A local insect but of quite wide distribution and often common where it occurs.

61. Bishop Wilton; Filey; Kilnsea; Thixendale.

62. Helmsley; Malton; Pickering; Strensall Common.

63. Deffer Wood, rare in 1926; Keighley; Seckar Wood near Barnsley; Skelmanthorpe; Thorne Moor; Wakefield.

64. Apperley Bridge near Bell Busk; Askham Bog; Ferrensby; Harrogate.

(to be continued)

YORKSHIRE NATURALISTS' UNION EXCURSIONS IN 1969

LASTINGHAM V.C. 62 — 24th to 26th May

In spite of a poor weather forecast for the Whitsuntide weekend, two of our three days were brilliantly sunny and the meeting was thoroughly enjoyed. In all, one hundred and twenty five members and associates attended during the week-end representing nineteen affiliated Societies.

Our President, Miss C. Rob, took the Chair at the meeting for reports after tea at Lavingham Lodge, on the final day. Miss Crackles proposed a vote of thanks to Mr. Ian Lawrence, the Divisional Secretary, who had made the arrangements, and to the many local landowners who had so kindly allowed us to visit their land.

The southern part of the 10 km. square SE 79 was visited on the Saturday morning, when we followed the course of the Hole Beck north into the peaty, acid soils of Spaunton Moor. In the afternoon we moved south into SE 78 onto the wooded limestone escarpment of Spaunton banks which lies immediately south of Lavingham. The whole of Sunday was spent exploring the banks of the Seven valley, just south of Appleton-le-Moors and still in SE 78. The Monday excursion, again in SE 78, was to the delightfully unspoilt farmland and woodland which lies in the part of the Seven valley immediately west of Cropton.

Ornithology (A. J. Wallis): During the weekend 68 species were recorded, of which 43 occurred in both 10 km. squares covered (SE 78 and SE 79). Eleven were seen only in the more southerly square, mainly species of deciduous woodland, such as Tawny Owl, Jay, Garden Warbler and Chiffchaff. Of the 14 species seen only in square SE 79 the moorland habitat provided the majority as was to be expected. These included Red Grouse, Golden Plover, Curlew, Wheatear and Whinchat; the more mature woods close to Lavingham also included Nuthatch, Pied Flycatcher and Treecreeper not seen among the younger trees in square SE 78. Definite evidence of breeding was found for the following species: nest with eggs, or birds sitting and not disturbed, Carrion Crow, Blackbird, Song Thrush, Robin, Willow Warbler, Meadow Pipit, Linnet and Chaffinch; feeding young, Rook, Nuthatch, Treecreeper, Dipper, Pied Wagtail, Starling; fledged young, Tawny Owl — two young birds, looking very bedraggled after a heavy shower of rain, were seen in an alder tree with the parent bird close by, Swifts were seen visiting nesting holes, Tree Sparrows carrying nesting material, and a used nest of a Long-tailed Tit was found. Single Wood Warblers were heard and seen, one in each of the squares; Siskins were heard singing in square SE 79, and a female was picked up dead in square SE 78 though some way from the area covered by the various official routes. Spotted Flycatchers were numerous, especially in the immediate vicinity of both Lavingham and Appleton-le-Moors, while on the other hand Redstarts were few and far between in an area which would appear to be eminently suitable for them.

The full list of species recorded (with 78 or 79 in parenthesis to indicate species seen in only the one 10 km. square) is: Heron (78), Mallard, Sparrowhawk, Kestrel (79), Red Grouse (79), Partridge (78), Pheasant, Lapwing, Golden Plover (79), Snipe, Curlew (79), Herring Gull (78), Stockdove (78), Wood Pigeon, Turtle Dove (78), Cuckoo, Tawny Owl (78), Swift, Great Spotted Woodpecker (78), Skylark, Swallow, House Martin (79), Carrion Crow, Rook (78), Magpie, Jay (78), Great Tit, Blue Tit, Coal Tit (79), Marsh Tit (79), Long-tailed Tit, Nuthatch (79), Treecreeper (79), Wren, Dipper, Song Thrush, Blackbird, Wheatear (79), Whinchat (79), Redstart, Robin, Blackcap, Garden Warbler (78), Whitethroat, Willow Warbler, Chiffchaff (78), Wood Warbler, Goldcrest (79), Spotted Flycatcher, Pied Flycatcher (79), Dunnock, Meadow Pipit, Tree Pipit, Pied Wagtail, Starling, Greenfinch, Goldfinch, Siskin (79), Linnet, Redpoll, Bullfinch, Chaffinch, Yellowhammer, Reed Bunting (79), House Sparrow, Tree Sparrow.

Vertebrates other than birds (C. Simms): Traps were not employed, fishes and bats were not investigated. The recorder wishes to thank others for several clues and sightings. His own work was concentrated on Hutton Ridge and Spaunton Moor whilst the main party worked the Skipster and Bishop Hagg woods, so his woodland observations were confined to the Cropton Woods and Cropton Banks scrub on Monday. Despite ideal conditions few reptiles were seen on the moorlands; only Viviparous Lizards and Vipers were found where two other species (Grass Snakes and Slow Worms) have been recently reliably noted. The moorland edge yielded the newts *Triturus helveticus* and *T. vulgaris*, and the Common Frog was often seen in the sikes

above Lastingham. M. Buckler and the recorder found early young of the lizard and a spent female viper on 23rd July in the slacks above Lastingham; as this report is being compiled other evidence of early viper broods in the district is to hand.

The mammals were not well worked; the most interesting observation being of ball nests of *Clethrionomys glareolus* in hazel stems at Cropton Banks. Molehills, a Common Shrew, a Stoat, an occupied Fox earth found by Mrs. Russell, abundant signs of Badgers in the Cropton woods (setts pointed out by Mr. Simpson), Rabbits and Hares noted by the conchologists and Grey Squirrels by Mr. Simpson concluded a rather disappointing list. No evidence was seen of Roe Deer or, amongst the rodents, of *Microtus*, *Rattus* or *Mus*. *Arvicola* and *Apodemus* were not handled, although there were indications of their presence.

Conchology (L. Lloyd-Evans): Fifty-two species of mollusca were taken during the weekend, thirty-two species being found in both grid squares. The following is a complete list with the localities and grid squares in which each species was taken:

- 1 = Spaunton Moor, 44/79
2 = Appleton-le-Moors, 44/78
3 = Cropton Banks, 44/78

<i>Potamopyrgus jenkinsi</i> (Smith), 1	<i>Arion intermedius</i> Normand, 1, 2
<i>Carychium minimum</i> Müller, 1, 2	<i>A. circumscriptus</i> Johnston, 1, 2
<i>C. tridentatum</i> (Risso), 1, 2	<i>A. fasciatus</i> (Nilsson), 1, 2
<i>Lymnaea truncatula</i> Müller, 1, 2	<i>A. hortensis</i> Férussac, 2
<i>L. peregra</i> (Müller), 2	<i>A. subfuscus</i> (Draparnaud), 2
<i>Planorbis crista</i> (L.), 3	<i>Arion ater</i> agg., 1, 2
<i>Cochlicopa lubrica</i> (Müller), 1, 2	<i>Euconulus fulvus</i> (Müller), 1, 2
<i>C. lubricella</i> (Stabile), 1, 2	<i>Vitrea crystallina</i> (Müller), 1, 2
<i>Vertigo pygmaea</i> (Drap.)	<i>V. contracta</i> (Westerlund), 1, 3
<i>Lauria cylindracea</i> (da Costa), 1, 2	<i>Oxychilus cellarius</i> (Müller), 1, 2
<i>Acanthinula aculeata</i> (Müller), 3	<i>O. alhiarius</i> (Miller), 1, 2
<i>Vallonia excentrica</i> Sterki, 1, 2	<i>Retinella radiatula</i> (Alder), 1, 2
<i>Ena obscura</i> (Müller), 3	<i>R. pura</i> (Alder), 2
<i>Marpessa laminata</i> (Montagu), 1, 2	<i>R. nitidula</i> (Drap.), 1, 2
<i>Clausilia bidentata</i> (Ström), 2	<i>Vitrina pellucida</i> (Müller), 1, 2
<i>Ceciloides acicula</i> (Müller), 3	<i>Milax budapestensis</i> (Hazay), 1, 2
<i>Arianta arbustorum</i> (L.), 1, 2	<i>Limax maximus</i> L., 1, 2
<i>Helix hortensis</i> Müller, 2	<i>L. cinereoniger</i> Wolf., 2
<i>H. nemoralis</i> L., 1, 2	<i>Lehmannia marginata</i> (Müller), 1, 2
<i>H. aspersa</i> Müller, 1, 2	<i>Agriolimax reticulatus</i> (Müller), 1, 2
<i>Hygromia striolata</i> (C. Pfeiffer), 1, 2	<i>A. laevis</i> (Müller), 1, 2
<i>H. hispida</i> (L.), 1, 2	<i>Sphaerium lacustre</i> (Müller), 2
<i>Monacha cantiana</i> (Montagu), 1, 2	<i>Pisidium casertanum</i> (Poli), 2
<i>Helicella itala</i> (L.), 2	<i>P. obtusale</i> (Lamarck), 2
<i>H. caperata</i> (Montagu), 3	<i>P. milium</i> Held, 2
<i>Discus rotundatus</i> (Müller), 1, 2	<i>P. subtruncatum</i> Malm, 2

Flowering Plants (C. M. Rob): The position of Lastingham at the northern end of the limestone hills and on the edge of acres of heather moor, provided the botanists with plenty of good habitats which, but for the very late spring would have given a fine selection of flowering plants. As it turned out the woodland plants were more like those of Easter than Whitsun, with Primroses and dog-violets in profusion.

The moorlands which were explored on Saturday yielded little of interest. *Myrica gale* (Bog Myrtle) is plentiful in this part of the Yorkshire moors, although absent from most of those to the west of Blakey Rigg; *Drosera rotundifolia* (Common Sundew) grows in most of the damper areas and *Genista anglica* (Petty Whin), *Carex dioica* and *Equisetum sylvaticum* (Wood horse-tail) were all additions to the 10 km. square. Spaunton banks, the steep north-facing woodland to the south of the village, is largely new plantation, but here *Vicia sylvatica* (Wood vetch) was noted, also *Adoxa moschatellina* (Moschatel) both new to the square. In some wet ground near a small stream, a good patch of *Ranunculus lenormandi* was another good find; although not uncommon in the Pennine valleys the plant is very rare on the eastern uplands.

Both Sunday and Monday were spent in woodland to the south of the village, the woods visited, Skipster and Bishop Hagg, Cropton banks and Howlgate head, were of different ages, the most interesting being Cropton Banks. Here a number of the lime-loving plants of the district were noted, but generally in small patches; nowhere did

one see *Convallaria* in the quantity generally found in this part of the county. *Neottia nidus-avis* (Birds nest orchid), *Ophrys insectifera* (Fly orchid), *Aquilegia vulgaris* (Columbine), *Paris quadrifolia* (Herb Paris) and *Melampyrum pratense* (Cow-wheat) were some of the best finds. *Narcissus pseudo-narcissus* was in a few places by the river. The hybrid Oxlip *Primula veris* x *vulgaris* was abundant, some of the plants in Cropton Banks being exceptionally fine. *Orchis mascula* (Early purple orchid) was in all the woods but the plants in Dawsons woods, which had been felled some years ago and now consist of overgrown coppice, were in glorious condition.

Orchis morio (Green winged Orchid) was seen in at least two places. This orchid, once not uncommon, has become rare in the last fifty years and this was one of the best finds of the day. *Ophioglossum vulgatum* (Adder's-tongue) was plentiful in one of the *O. morio* fields.

The weekend's work resulted in 16 additions to the *Atlas* for the northern square SE 79 and 19 to the southern one SE 78. As both squares had been fairly well worked in the past these numbers are very satisfactory.

Bryology (Mary Dalby): On Spaunton Moor above Lastingham village eleven species of sphagna were gathered: *S. palustre*, *S. papillosum*, *S. compactum*, *S. recurvum*, *S. cuspidatum*, *S. tenellum*, *S. subsecundum* var. *auriculatum*, *S. fimbriatum*, *S. rubellum*, *S. capillaceum* and *S. plumulosum*. In addition *Odontoschisma sphagni*, *Mylia anomala*, *Nardia compressa*, *Lepidozia setacea* and *Cephalozia connivens* were among the more interesting hepatics noted. Wet flushes among the cotton grass produced *Drepanocladus revolvens*, *D. exannulatus*, *Aulacomnium palustre* and, rather surprisingly, *Girriphyllum piliferum* woven into the dryer tussocks.

Appleton-le-Moors was visited on the Sunday; here the floor of an old quarry yielded such species as *Brachythecium albicans*, *Mnium cuspidatum*, *Climacium dendroides*, *Ctenidium molluscum* and in limestone turf nearby Miss Robertson found *Thuidium philiberti*. On the banks of the lane to Hagg Sitt Wood were *Campylium chrysophyllum*, *Encalypta vulgaris* c.fr., *Mnium stellare* and *Eurhynchium murale*. Another interesting habitat was a wet limestone outcrop near the river where *Anomodon viticulosus* hung in great curtains. *Porella platyphylla*, *Solenostoma triste*, *Leiocolea turbinata*, *Metzgeria furcata*, *Neckera complanata*, *Omalia trichomanoides*, *Fissidens cristatus* and *Grimmia apocarpa* were found. Dr. Cockram also noted *Fissidens viridulus*, and Miss Robertson found *Orthotrichum affine* and *O. diaphanum*.

On Monday at Cropton Banks Wood Miss Robertson found a number of calcicole species including *Metzgeria pubescens*, *Neckera crispa* and *Omalia trichomanoides* with fruit. She also discovered *Seligeria recurvata* and *Frullania dilatata*.

Mycology (W. G. Bramley): The cold Spring held back a good many of the smaller fungi one would have expected to see at this date. The small Discomycetes were either absent or in very young condition and the number and extent of the rusts was sparse. Little was expected from the moors above Lastingham though the slacks yielded a few characteristic species, e.g. *Mitrella paludosa*, *Omphalina ericetorum* and a few fructifications of *Sclerotinia cureyana*. Near the village a few leaves of *Anemone* with the white pustules of *Ochropsora ariae* were discovered amongst the commoner *Puccinia fusca* and indeed small isolated patches were seen on all three days. There appear to be only two published records in the past three decades at Pickering and Coxwold but I have seen it at Aysgarth. Dr. Sledge informs me that F. A. Mason showed it to him at Colt Park Wood in 1930.

Within a hundred yards of setting out at Appleton-le-Moors a small patch of *Adoxa* was found badly attacked by *Ramularia adoxae*, the second Yorkshire record. Last year it turned up near Thornton Dale and there are only two published Scotch records and one specimen from England and one from Wales at Kew. Miss Rob passed on to me a stem of Marjoram bearing aecidia of *Puccinia menthae*. So far only uredospores have been found occasionally on this host in the county. Crossing the fields at the end of the day a few St. George's mushrooms were taken and added flavour to the next morning's breakfast. Rain on Monday was not conducive to collecting but the second record for the county of *Massarina alni* was made near Cropton Mill on fairly recently cut branches of *Alnus*.

* Not in Catalogue of Yorkshire Fungi for V.C. 62.

† Not in Catalogue of Yorkshire Fungi.

A = Appleton-le-Moors

C = Cropton Mill and valley

L = Lastingham

- * *Plasmopara pusilla* (de Bary) Schroet., A.
Colpoma quercinum (Pers.) Wallr., A.
 * *Dasyscypha apala* (B. & Br.) Dennis, L.
 * *D. grevillei* Mass., on *Petasites* stems, A.
 * *Microscypha grisella* (Rehm) Lyd., on *Pteridium*, A.
Mitrophora semilibera (DC.) Lév., A.
Mollisia discolor (Mont. & Fr.) Phill., on *Quercus* twig, A.
Tapesia rosae (Pers. ex Fr.) Fuckel, on *Rosa canina* A, certe W. D. Graddon.
 † *Massarina alni* (Otth) Sacc., on *Alnus*, C.
Ochropsora ariae (Fuckel) Ramsb., 1 on *Anemone*, A. C. L.
Puccinia menthae Pers., 1 on *Origanum*, A.
 * *Entyloma ficariae* (Berk.) F. van Wald., on *Ranunculus ficaria*, A.
Pseudohiatula stephanocystis Hora, on buried cones of *Pinus*, L.
Pistillaria uncialis (Grev.) Cost. et Dufour, on Umbellifer stem, C.
 † *Botrytis globosa* Rabenh., on *Allium ursinum*, A. C.
 † *Ramularia adoxae* (Rabenh.) Karst., on *Adoxa*, A.
Steganosporium pyriformis (Hoffm.) Corda, on *Acer*, A.

BRANDESBURTON GRAVEL PITS, V.C. 61 — 7th June

Mr. E. Chicken, the Divisional Secretary, had prepared a most helpful map to guide us to the twelve flooded gravel pits in the area around Brandesburton and we were able to see an interesting range of habitats from recently exposed sand to old pits with plant and animal communities which had been established for many years.

Thirty-five members were present, representing thirteen affiliated societies. The President, Miss C. Rob, took the Chair at the Meeting for Reports after tea at the 'Black Swan', Brandesburton. A vote of thanks to Mr. Chicken for his work in organising and leading the excursion, and to the landowners, Hoveringham Gravels Ltd. was expressed by Mrs. A. C. M. Duncan.

Ornithology (J. Hesslewood): Thanks to Mr. Chicken's excellent sketch maps, the ornithologists were able to split up and visit all twelve gravel pits and see a total of 50 species.

Water birds were scarce in view of the large area of water available, the only ducks seen being a pair of Mallard and Tufted Duck. Two Great Crested Grebes were recorded with two pairs of Mute Swan and one Canada Goose while Moorhen and Coot were also very few. Two Little Ringed Plover were seen together with five Turtle Doves in one area and Pied Wagtails were observed carrying nesting material. Sedge Warblers were vocal and one area of *Phragmites* also held Reed Warblers. Cuckoos, Wood Pigeon, Wren, Dunnock, Blackcap, Whitethroat, Willow Warbler, Robin, Blue Tit, Chaffinch and Bullfinch were seen in wooded areas surrounding some of the pits and Lapwing were present in flooded areas. Tree Sparrows and Sand Martins were numerous in the pits but only two Swifts were seen.

Other species recorded were Kestrel, Partridge, Black-headed Gull, Herring Gull, Great Black-backed Gull, Common Gull, Skylark, Swallow, House Martin, Yellow Wagtail, Blackbird, Song Thrush, Corn Bunting, Yellowhammer, Reed Bunting, Greenfinch, House Sparrow, Starling, Magpie, Jackdaw, Rook and Carrion Crow.

Conchology (K. Moorhouse): Four different gravel pits produced molluscs. In the first one, immediately south of the farmstead 'Hempholme' we found *Helix aspersa*, *Cepaea nemoralis*, *Sphaerium corneum*, *Bithynia tentaculata*, *Potamopyrgus jenkinsi*, *Lymnaea stagnalis*, *L. peregra*, *Planorbis planorbis*.

In a pool just north of 'Burshill' were *Helix aspersa*, *Cepaea nemoralis*, *Monacha cantiana*, *Oxychilus cellarius*, *Helicella caperata*, *Agriolimax reticulatus*, *Lymnaea stagnalis* and *Anodonta anatina*.

The third area examined was a pit adjacent to 'Barff House'. Here we saw *Arion ater*, *Hygromia striolata*, *Oxychilus alliarius*, *Planorbis albus*, *Euconulus fulvus* and large quantities of *Anodonta anatina*. From another one alongside the Brandesburton-Catwick road, we recorded *Arion ater*, *Arion hortensis*, *Arion intermedius*, *Agriolimax laevis*, *A. reticulatus*, *Arion circumscriptus*, *Oxychilus cellarius*, *Lymnaea peregra*, *Planorbis corneus* and *Sphaerium corneum*.

Entomology (Mr. Wade): The warm and sunny weather was suitable for insects and Damsel, Dragon, May and Caddis Flies were on the wing.

Lepidoptera recorded were *Pieris brassicae*, *P. napi*, *P. rapae*, the Orange Tip (*Euchloë cardamines*), the Wall (*Pararge megera*), the Small Copper (*Lycaena phlaeas*), the Small Tortoiseshell (*Aglais urticae*), and the larvae of the Garden Tiger moth (*Arctia caji*), the Burnet Moth (*Zygaena filipendulae*), the Quaker Moth (*Agrochola macilenta*) and the adult Silver Ground Carpet Moth (*Xanthorhoe montanata*).

Vascular Plants (E. Crackles): A number of gravel pits between Hempholme and Catwick were visited. The most interesting species noted were *Alopecurus aequalis* (Orange Foxtail) and *Eleocharis uniglumis*, both in the same area of shallow pools and marsh, to the south-east of Brandesburton; *Epilobium palustre* (Marsh Willow-herb), *Parnassia palustris* (Grass of Parnassus) and *Zannichellia palustris* (Horned Pondweed) also occur in the same locality.

Species seen in or at the margins of the water-filled pits include: *Equisetum fluviatile* (Water Horsetail), *E. palustre* (Marsh Horsetail), *Ranunculus sceleratus* (Celery-leaved Crowfoot), *Hippuris vulgaris* (Mare's-tail), *Polygonum amphibium* (Amphibious Bistort), *Veronica beccabunga* (Brooklime), *Alisma plantago-aquatica* (Water-Plantain), *A. lanceolatum*, *Elodea canadensis* (Canadian Pondweed), *Potamogeton natans* (Broad-leaved Pondweed), *P. lucens* (Shining Pondweed), *P. crispus* (Curled Pondweed), *Groenlandia densa* (Opposite-leaved Pondweed), *Typha angustifolia* (Small Bulrush), *T. latifolia* (Bulrush), *Scirpus lacustris* (Lake Clubrush), *S. tabernaemontani* (Glaucous Lake Club-rush) and *Eleocharis palustris* (Common Spike-rush). *Lythrum salicaria* (Purple Loosestrife) and *Eupatorium cannabinum* (Hemp Agrimony) were recorded at one pit near Hempholme, whilst *Ranunculus aquatilis* ssp. *pseudofluitans* and *Myriophyllum spicatum* (Spiked Water-milfoil) occurred in a nearby drain.

Species recorded on the dry gravels included: *Geranium pyrenaicum* (Mountain Cranesbill), *Papaver somniferum* (Opium Poppy), *Arabis hirsuta* (Hairy Rock-cress) and *Cerastium arvense* (Field Mouse-ear Chickweed) in pits near Hempholme; *Erophila verna* (Whitlow Grass), *Cerastium glomeratum* (Sticky Mouse-ear Chickweed) and *Catapodium rigidum* (Hard Poa) in a pit near Brandesburton. A number of plants of *Papaver argemone* (Long Prickly-headed Poppy) were seen in a pit between Brandesburton and Catwick, together with *Erodium cicutarium* (Storksbill), *Scleranthus annuus* (Annual Knapel) and *Lycopsis arvensis*. *Senecio squalidus* (Oxford Ragwort) and *Geranium pusillum* were seen in another pit in this vicinity. From only one pit, near to Brandesburton, came reports of such calcicoles as *Anthyllis vulneraria* (Kidney Vetch) and *Centaurea scabiosa* (Greater Knapweed).

Bryology (Mary Dalby): Miss Robertson and Miss Hartley collected the following species: *Marchantia polymorpha*, *Riccardia sinuata*, *R. pinguis*, *Pellia endiviifolia*, *Atrichum undulatum*, *Ceratodon purpureus*, *Dicranella varia*, *Barbula unguiculata*, *B. fallax*, *Grimmia apocarpa*, *Funaria hygrometrica*, *Bryum pseudotriquetrum*, *B. bicolor*, *Leptobryum pyriforme*, *Cratoneuron filicinum*, *Drepanocladus aduncus*, *Acrocladium cuspidatum*, *Brachythecium rutabulum* and *Eurhynchium swartzii*.

UPPER DERWENT VALLEY, V.C. 63 — 21st June

The Upper Derwent Valley is a particularly beautiful part of V.C. 63 and our meeting was held in superb weather. Twelve affiliated societies were represented by the eighteen people present.

We were fortunate to have with us a knowledgeable local botanist in the person of Mr. Waite, of the Sorby Natural History Society, who showed us the fast diminishing remnants of Bearberry (*Arctostaphylos uva-ursi*) in this part of Yorkshire. After tea, we were shown it again, in excellent condition, high up behind the Ladybower Inn, a few miles from the Yorkshire site, but just within Derbyshire.

The Chair was taken by Mr. G. Shaw at the meeting for reports, after tea at the Ladybower Inn. A vote of thanks to Mr. R. Crossley, the Divisional Secretary, for organising the day, was proposed by Mr. C. Disbrey.

Ornithology (C. Disbrey): The following species were seen: Kestrel, Red Grouse, Lapwing, Golden Plover, Snipe, Curlew, Common Sandpiper, Lesser Black-backed Gull, Woodpigeon, Swift, Skylark, Swallow, Carrion Crow, Magpie, Jay, Great Tit, Blue Tit, Wren, Dipper, Mistle Thrush, Song Thrush, Ring Ouzel, Blackbird, Wheatear, Whinchat, Robin, Garden Warbler, Willow Warbler, Goldcrest, Meadow Pipit, Tree Pipit, Pied Wagtail, Grey Wagtail, Starling, Greenfinch, Linnet, Redpoll, Chaffinch, House Sparrow and Black-headed Gull.

Entomology (R. Crossley): As was to be expected in this type of moorland locality, insects were not generally plentiful and neither was there much variety. It was too early for most Heteroptera and the bugs seen were all nymphs with the exception of the ground-dwelling predator *Saldula saltatoria* L. which was found on one of the paths. Amongst stones by the stream were nymphs of a saldid species, probably *scotica* and in the same habitat were the ground beetles *Nebria rufescens* (Stroem.), and *Bembidion atrocoeruleum* Steph. The very handsome burying beetle *Necrophorus vespilloides* Hb. was found on a dead grouse and the longhorn *Rhagium mordax* (D.G.), was captured on a rowan. This solitary rowan tree near the stream was flowering profusely and it acted as a magnet in the bright sunshine for many flying insects, principally hover flies, and most of my collecting was done at that point. All the flies taken were common and likely to be found in any type of habitat. The one exception was the handsome moorland fly *Sericomys lappona* L., and also seen was its more widely distributed relative *S. silentis* Harris. The others, listed purely for record purposes, were: *Platychirus manicatus* Mg., *P. albimanus* Fab., *P. angustatus* Zett., *Melanostoma scalare* Fab., *Sphaerophoria menthastri* L., *Syrphus cinctellus* Zett., *Liogaster metallina* Fab., *Chrysogaster hirtella* Loew, *Eristalis pertinax* Scop., *E. nemorum* L., *Helophilus pendulus* L.

The sawflies *Stromboceras delicatulus* (Fall.), and *Tenthredo moniliata* Klug., were also taken here.

Mr. P. Skidmore kindly identified the ground beetles and sawflies for me.

Vascular Plants (C. B. Waite): Crossing Slippery Stones Bridge to the Yorkshire side of the river, the steep hillside immediately in front consisted mainly of:

<i>Nardus stricta</i>	<i>Potentilla erecta</i>
<i>Deschampsia flexuosa</i>	<i>Luzula campestris</i>
<i>Festuca ovina</i>	<i>Vaccinium myrtillus</i>
<i>Galium saxatile</i>	

Low-lying bog, formed between *Molinia caerulea* carried *Eriophorum angustifolium* and *E. vaginatum*, with a fairly large area of *Carex rostrata*, in addition to:

<i>Carex panicea</i>	<i>Cardamine flexuosa</i>
<i>C. nigra</i>	<i>Ranunculus flammula</i>
<i>C. echinata</i>	<i>R. lenormandi</i>
<i>Scirpus caespitosus</i>	<i>Galium palustre</i>
<i>Hydrocotyle vulgaris</i>	<i>Viola palustris</i>
<i>Erica tetralix</i>	<i>Anthoxanthum odoratum</i>
<i>Oxycoccus palustris</i>	

As the hillside closed in, the steeper sides by the river were cut by small streams and wet flushes, most of which contained:

<i>Cirsium palustre</i>	<i>Cardamine pratensis</i>
<i>Chrysosplenium oppositifolium</i>	<i>Epilobium palustre</i>
<i>Stellaria alsine</i>	<i>Carex laevigata</i>
<i>Montia verna</i>	<i>C. demissa</i>
<i>Lysimachia nemorum</i>	<i>Equisetum palustre</i>

Pteridium aquilinum was predominant on the lower hill slopes, leading up to moorland, interspersed with *Calluna vulgaris*, *Vaccinium vitis-idaea*, *Carex pilulifera* and *Deschampsia flexuosa*. At Broomhead Clough, the lower section near the river yielded:

<i>Betula verrucosa</i>	<i>Ranunculus repens</i>
<i>Sorbus aucuparia</i>	<i>Rumex acetosa</i>
<i>Ilex aquifolium</i>	<i>Nasturtium microphyllum</i>
<i>Quercus sessiliflora</i>	<i>Bellis perennis</i>
<i>Corylus avellana</i>	<i>Dryopteris austriaca</i>
<i>Holcus mollis</i>	<i>Blechnum spicant</i>
<i>Oxalis acetosella</i>	<i>Athyrium filix-femina</i>

In Stainery Clough the party visited the one known plant of Bearberry (*Arctostaphylos uva-ursi*), which was dead. Crossing to the better station at the side of the path up the Derwent, just beyond the Stainery Clough confluence, the path had been cut back, causing loss of several plants. Apart from this, three or four plants were found completely dead, known to have been perfectly healthy a year or two ago. A diligent search produced three plants, but the prospects of survival at this station are not good.

Following tea and the meeting at Ladybower Inn, a small party climbed the hill at the back of the Inn to the excellent Bearberry station (in Derbyshire) under the

Edge behind Robin Croft. Here the plant formed a hanging carpet at the small quarry face — in fruit, sparingly. The patches higher up the open hillside seemed to have increased, and were very healthy.

Bryology (E. Thompson): When the meeting commenced in the Upper Derwent Valley four members of the Bryological Section were present. At Slippery Stones the party crossed the bridge into Yorkshire where serious collecting began.

Here bogs by the infant river held a surprising amount of *Mnium longirostrum*, with its erect fertile shoots being most obvious. Present also was a good amount of *Philonotis caespitosa*. Signs of more basic conditions were revealed with the appearance of *Cratoneuron commutatum* on wet ledges just above the bogs. Narrow moorland cloughs joined the main valley at intervals but only one was explored. This had some fine wet cliffs that were festooned with masses of *Hookeria lucens* and the hepatic *Scapania undulata*. Dense cushions of the obscure but interesting moss *Amphidium mougeotii* also occurred. On rocks in the tributary stream *Brachythecium rivulare* and *Dichodontium pellucidum* were dominant. Only two species of Sphagnum were present in any quantity. These were sent to Miss M. Dalby who duly named them *S. subsecundum* and *S. fimbriatum*.

For a large area like this the list of bryophytes found is obviously not complete and most members felt that given time the district could provide more. Thanks are due to Mrs. M. Gow, Miss Robertson, Miss M. Dalby, Mr. G. A. Shaw and Mr. F. E. Branson for their kind help in various ways.

Mosses and liverworts found but not mentioned above are listed below:

MUSCI

Acrocladium cuspidatum
A. stramineum
Aulacomnium palustre
Atrichum undulatum
Bryum pseudotriquetrum
Dicranella heteromalla
D. palustre
Drepanocladus fluitans
D. revolvens
Fissidens taxifolius
Hyocomium flagellare
Isopterygium elegans
Orthodontium lineare
Pohlia wahlenbergii

HEPATICAE

Calypogeia fissa
Conocephalum conicum
Chiloscyphus polyanthos
Cephalozia bicuspidata
Lophozia ventricosa
Gymnocolea inflata
Pellia epiphylla

Nomenclature according to the
current census catalogues.

JERVAULX ABBEY, EELMIRE AND SWINTON PARK, V.C. 65

Saturday, 5th July and Sunday, 6th July

This two-day meeting was blessed with excellent weather throughout. Seventy-five members in all, representing twenty member societies were present. Saturday was spent visiting the grounds of Jervaulx Abbey and Eelmire. On the Sunday, a last-minute rearrangement of plans, due to the much regretted and untimely death of Lady Ropner, who was to have been our guide at Camphill, resulted in our visiting the banks of the Ure to the north of Masham in the morning, and the grounds of Swinton Castle in the afternoon.

The President, Miss C. M. Rob, was in the Chair for the meeting for reports after tea at the King's Head, Masham. Mr. Ian Lawrence expressed thanks to Mrs. J. Holloway, the Divisional Secretary, for planning and running the weekend so effectively and to Lady Swinton and Col. Christie of Jervaulx, for so kindly allowing us to visit their estates.

Ornithology (G. E. Alderson): Great Spotted Woodpecker was seen at Jervaulx and a number of the commoner species. The River Ure had Oystercatchers, Lesser Black-backed Gull, Sandpiper, Mallard and Pied Wagtail. Spotted Flycatchers were seen feeding young. Redshank were at the edge of shallow water near the river.

At Eelmire, woodland and scrub produced Turtle Dove, Bullfinch, Greenfinch, Curlew, Willow Warbler and Pheasant. A keeper's 'larder' had three Carrion Crows, a Jay and two Stoats on the barbed wire. Tufted Duck flew over and Mallard had young on the pool in the woodland.

Sunday was spent upstream along the river bank at Masham and in the grounds of Swinton Castle in the afternoon. The river at Masham had Dipper, Mallard, Herring Gull, Black-headed Gull, Curlew, Reed Bunting, Sandpiper, Pied Wagtail and a Moorhen with eggs. A pair of Great Crested Grebes were on the flooded gravel pit nearby. At Swinton, the only Raptores of the weekend were a pair of Kestrels. The usual feral Canada Geese were present on the Park waters, with young birds of the year. A Jay was heard in the woodland and an owl being mobbed.

Other species seen or heard were Carrion Crow, Jackdaw, Snipe, Coot, Partridge, Swift, Swallow, House Martin, Yellowhammer, Tree Creeper, Linnet, Blackcap, Whitethroat, Garden Warbler, Chiffchaff, Robin, Willow, Coal, Blue and Long-tailed Tits, Grey Wagtail, Meadow Pipit, Wren, House and Tree Sparrow, Hedge Sparrow and Heron. Sixty-six species were recorded in the composite list for the weekend.

Mammals and Amphibians (G. Alderson): Dr. Lloyd Evans reported seeing both Smooth Newts and Crested Newts and Toads by the ponds at Jervaulx. Toads were also recorded from Swinton Park and Common Frog in marshy ground near the Ure at Masham.

Rabbits were seen by two people only. Stoats were on a keepers' gibbet.

Conchology (L. Lloyd-Evans): Fifty-seven species were taken during the weekend at the following localities:

- 1 = Jervaulx and Eelmire, 44/18
- 2 = Banks of River Ure north of Masham, 44/28
- 3 = Swinton Park, 44/27

Theodoxus fluviatilis (L.), 2
Valvata cristata Müller, 1
Potamopyrgus jenkinsi (Smith), 2
Carychium minimum Müller, 1, 2, 3
C. tridentatum (Risso), 1, 2, 3
Lymnaea truncatula (Müller), 1, 2
L. palustris (Müller), 1
L. peregra (Müller), 2, 3
Planorbis leucostoma Millet, 1
P. albus Müller, 1, 3
P. crista (L.), 1, 3
Ancylus fluviatilis Müller, 2
Segmentina complanata (L.), 3
Succinea pfeifferi Rossmässler, 1, 2
Cochlicopa lubrica (Müller), 1, 2, 3
C. lubricella (Stabile), 1
Columella edentula (Drap.), 2
Vertigo pusilla Müller, 1
Lauria cylindracea (da Costa), 1
Vallonia excentrica Sterki, 1
V. costata (Müller), 1
V. pulchella (Müller), 2
Ena obscura (Müller), 1
Marpessa laminata (Mont.), 2
Clausilia bidentata (Ström), 1, 2
Ceciloides acicula (Müller), 1
Helix hortensis Müller, 1
H. nemoralis L., 1
H. aspersa Müller, 1

Hygromia striolata (C. Pfeiffer), 1, 2, 3
Monacha granulata (Alder), 1, 2
Discus rotundatus (Müller), 1, 2, 3
Arion intermedius Normand, 1, 2, 3
A. circumscriptus Johnston, 1, 2
A. fasciatus (Nilsson), 1, 2, 3
A. hortensis Férussac, 1, 3
A. subfuscus (Drap.), 1, 3
A. ater agg., 1, 2, 3
Euconulus fulvus (Müller), 1, 2, 3
Vitrea contracta (Westerlund), 1, 2
V. crystallina (Müller), 2, 3
Oxychilus cellarius (Müller), 1, 2
O. alliarius (Müller), 1, 2, 3
O. helveticus (Blum), 1
Retinella pura (Alder), 1, 2
R. nitidula (Drap.), 1, 2
R. radiatula (Alder), 2, 3
Vitrina pellucida (Müller), 1, 2
Limax maximus L., 1, 3
Lehmannia marginata (Müller), 3
Agriolimax reticulatus (Müller), 1, 2, 3
A. laevis (Müller), 1, 2, 3
Pisidium personatum Malm, 1, 2
P. milium Held, 1, 3
P. subtruncatum Malm, 1
P. nitidum Jenyns, 1, 3
P. casertanum (Poli), 3

Flowering Plants (C. M. Rob and Mrs. J. Holloway): The botanists had a very enjoyable two days, the weather perfect and the routes chosen to give a wide variety of habitats. Saturday morning was spent in the grounds of the ruined abbey of Jervaulx where, unlike most ruins in these days, the walls were a fine sight with a wide variety of species, native and introduced. *Mimuartia hybrida* (Fine-leaved Sandwort) was plentiful and in fine condition, *Cheiranthus cheiri* (Wallflower) and *Antirrhinum majus* (Snapdragon) in good flower were in several places. *Echium vulgare* (Vipers Bugloss), *Lactuca virosa* (Great Lettuce), *Arabis hirsuta* (Hairy Rockcress), *Geranium lucidum* (Shining Cranesbill), *Origanum vulgare* (Wild Marjorum), *Verbascum thapsus* (Great Mullein) and both *Asplenium trichomanes* (Common Spleenwort) and *A. ruta-muraria* (Wallrue) were also abundant. A list of 170 species was compiled in and about the Abbey ruins.

After lunch and a short visit to some ponds at the south end of the park the party moved to Eel mire. The pool here is completely surrounded by dense scrub and the party owed grateful thanks to the Jervaulx Estate for the path cut for their benefit. At Eel mire *Cladium mariscus* (Great Fensedge) completely encircles the pool. This is the only known station for this rare Yorkshire plant in the North Riding and confirmation of Thwaites' 1902 record was perhaps the most notable botanical result of the meeting. In addition *Schoenus nigricans* (Black Bogrush), ten species of *Carex* including *C. lepidocarpa*, *C. vesicaria* and *C. elata*, *Campanula glomerata* (Clustered Bellflower) and *Dryopteris carthusiana* (Narrow Buckler-fern) were recorded.

Because of the tragic death of Lady Ropner in a road accident the previous week the visit to Camphill was cancelled; instead the party explored the bank of the River Ure from Masham bridge upstream by way of Marfield almost to Low Mains farm, an area noted for its lime-loving plants. Gravel abstraction workings have changed this bit of ground and the list of plants noted reflects the changes caused by modern methods of quarrying. The greater part of the more interesting plants appear to have gone; of those remaining *Paris quadrifolia* (Herb Paris), *Thalictrum flavum* (Greater Meadow-rue) and *Galeobdolon luteum* (Yellow Archangel) were the most noteworthy.

After lunch the party moved to the grounds and lake at Swinton, a complete contrast to the calcareous grassland of the river banks, with calcifuge plants such as Bilberry and *Blechnum spicant* (Hard-fern). Both White and Yellow Water-lily were in the lake while other species included *Menyanthes trifoliata* (Bog-bean), *Polygonum amphibium* (Amphibious Bistort) and *Poa nemoralis* (Wood Meadow Grass), the best find of the afternoon being a small stand of *Pyrola minor* (Common Wintergreen).

Bryology (F. E. Branson): I only attended this meeting for one day, Sunday, 6th July but did not go with the main party. Three of us visited Eel mire, walking from the road to the lake by a rough field track. The area was most disappointing bryologically and no species other than common ones were seen.

In marshy ground were quantities of *Cratoneuron filicinum* and *Acrocladium cuspidatum* which seemed to be the two most abundant species, also a little *Climacium dendroides*, *Campylium stellatum* and *Leptodictyum riparium*. On the edge of the lake was a nice patch of *Marchantia polymorpha* with a number of male heads.

The other species seen are as follows:

HEPATICAEE

Lophocolea bidentata

MUSCI

Funaria hygrometrica c fr.

Bryum argenteum

Mnium hornum

Fissidens taxifolius

Tetraphis pellucida

Dicranoweissia cirrata c fr.

Hypnum cupressiforme and var.
resupinatum

Brachythecium rutabulum c fr.

Pseudoscleropodium purum

Camptothecium sericeum

Eurhynchium swartzii

Cratoneuron commutatum var.
commutatum

Bryum capillare c fr.

Mnium undulatum

Mnium punctatum

Orthodontium lineare c fr.

Grimmia apocarpa

Amblystegium serpens c fr.

Thuidium tamariscinum

Rhytidiadelphus squarrosus

Eurhynchium praelongum

Ctenidium molluscum

Nomenclature follows *Census Catalogue of British Mosses* (3rd edition) by E. F. Warburg and *Census Catalogue of British Hepatics* (4th edition) by J. A. Paton.

Another party visited the Ure banks at Masham and Swinton Hall Park. Mr. J. Knight found *Schistostega pennata* in a sandstone quarry and Miss Robertson reported *Leskea polycarpa*.

HALTON GILL, V.C. 64 — 19th July

Forty members, representing fifteen affiliated societies, enjoyed this excursion in excellent weather. The valleys of both the Foxup and Cosh becks were investigated by different parties. The President, Miss C. Rob, took the Chair at the meeting for reports, after tea at the 'Falcon Hotel', Arncliffe. A vote of thanks to Miss H. Lefèvre, the Divisional Secretary, who had organised the meeting and to the landowners whose property we had explored, was proposed by Mr. Kemsley. Mrs. A. C. M. Duncan voiced the opinion of all members when she warmly thanked our President, Miss Rob, for giving so much of her time and expert guidance at our Field Meetings in 1969.

Ornithology (A. C. M. Duncan): The ornithologists divided into two parties so that both the Foxup and Cosh becks could be explored. The day was mainly cloudy with a strong westerly wind which made the birds keep to cover, but by the afternoon conditions had improved somewhat and the birds were easier to see in the sunshine.

The list of species seen totalled 44, including a number with young. Those most noteworthy were: Oystercatcher, which has been known to nest in this dale for a number of years now; Golden Plover; Raven; Yellow Wagtail (quite numerous); Twite; and Grey Wagtail.

Except for rabbits, hares, a shrew (found dead) and frogs, no other vertebrates were recorded.

Conchology (L. Lloyd-Evans): The following thirty-six species of mollusca were taken:

<i>Carychium minimum</i> Müller	<i>Monacha granulata</i> (Alder)
<i>C. tridentatum</i> (Risso)	<i>Discus rotundatus</i> (Müller)
<i>Lymnaea truncatula</i> (Müller)	<i>Arion intermedius</i> Normand
<i>Ancylus fluviatilis</i> Müller	<i>A. circumscriptus</i> Johnston
<i>Succinea pfeifferi</i> Rossmässler	<i>A. fasciatus</i> (Nilsson)
<i>Cochlicopa lubrica</i> (Müller)	<i>A. hortensis</i> Férussac
<i>Pyramidula rupestris</i> (Drap.)	<i>A. subfuscus</i> (Drap.)
<i>Columella edentula</i> (Drap.)	<i>A. ater</i> agg
<i>Vertigo pygmaea</i> (Drap.)	<i>Vitrea crystallina</i> (Müller)
<i>Lauria cylindracea</i> (da Costa)	<i>V. contracta</i> (Westerlund)
<i>Ena obscura</i> (Müller)	<i>Oxychilus cellarius</i> (Müller)
<i>Clausilia bidentata</i> (Ström)	<i>O. alliarius</i> (Miller)
<i>C. dubia</i> Drap.	<i>Retinella radiatula</i> (Alder)
<i>Balea perversa</i> (L.)	<i>R. nitidula</i> (Drap.)
<i>Arianta arbustorum</i> (L.)	<i>Vitrina pellucida</i> (Müller)
<i>Helix hortensis</i> Müller	<i>Lehmannia marginata</i> (Müller)
<i>Hygromia striolata</i> (C. Pfeiffer)	<i>Agriolimax reticulatus</i> (Müller)
<i>H. hispida</i> (L.)	<i>A. laevis</i> (Müller)

Lepidoptera (H. Pickup): One specimen of Grey Mountain Carpet (*Entephria caesiata*) was seen high up the Foxup beck and two specimens of Silver-Ground Carpet (*Xanthorhoe montanata*) by the Cosh beck where many Chimney Sweepers (*Odezia atrata*) were also seen. No other Lepidoptera were noted owing to the windy conditions which prevailed throughout most of the day.

Flowering Plants (C. M. Rob): Any meeting held in the limestone valleys is assured of success, given reasonable weather. On this occasion the party left Foxup in a shower with heavy clouds on the hill-tops but the clouds soon dispersed and the day got steadily better making the last field meeting of the year a most enjoyable outing.

About 235 species of flowering plant were recorded during the day and 17 of these are additions to the 10 km. square in the *Atlas*. Most of these additions were common plants which had been overlooked in the past, *Aphanes arvensis* (Parsley Piert), *Lolium multiflorum* (Italian Ryegrass) and *Chenopodium album* (White Goosefoot) being three of the very common species added. More interesting were several plants of *Platanthera chlorantha* (Greater butterfly Orchid) and *Rumex longifolius* (Butter Dock), the latter growing as expected near several of the many barns which are a feature of the Dales. *Saxifraga aizoides* (Yellow Saxifrage) was in fine condition in one place by Foxup beck and a few plants of *Sedum villosum* (Hairy Stonecrop) were seen near by. *Carex acutiformis* occurred in one small gill in the Cosh beck valley, *Gymnadenia conopsea* and *Dactylorhiza fuchsii* were abundant in the same valley as was *Equisetum sylvaticum* (Wood Horsetail). *Cirsium heterophyllum* (Melancholy Thistle) was at its best, making a fine show all along the route. *Ribes alpinum* (Mountain currant) was plentiful about Foxup village, one bush of *Salix pentandra* was growing just above the village and a few plants of *Viola hirta* were noted, growing with *Helianthemum chamaecistus* (Rockrose) near Foxup beck. The hybrid grass *Festulolium* (*Festuca pratensis* x *Lolium perenne*) was abundant near Foxup village as was *Festuca arundinaceae* (Reed Fescue) also new to this 10 km. square.

Bryology (Mary Dalby): Miss Robertson was the only bryologist present at this meeting. She collected a number of interesting hepatics including: *Cololejeunea calcarea*, *Leicolea muelleri*, *Reboulia hemisphaerica*, *Tritomaria quinqueidentata*, *Metzgeria pubescens* and *Solenostoma cordifolium*. The mosses found included *Distichium capillaceum*, *Plagiopus oederi*, *Mnium seligeri*, *Neckera crispa*, *Philonotis calcarea* and *Tortella tortuosa*.

BRYOLOGICAL MEETING AT HEBDEN VALLEY AND HARDCASTLE CRAGS, V.C. 63, APRIL 19th 1969

F. E. BRANSON

We had long been looking forward to this meeting, the main object of which was to see the hepatic *Jubula hutchinsiae*, found here first in 1896 by the late James Needham, of Hebden Bridge. At the Y.N.U. meeting in 1904, William Ingham, who wrote the Bryological report said '... Mr. Needham, who knows the ground so well, proved an admirable guide to the habitats of many rare mosses.' We were also favoured with an excellent guide in Mr. F. Murgatroyd, knowing the area so intimately. He showed us the little stream running into the River Hebden where *Jubula hutchinsiae* was growing in the running water, totally immersed, mixed with a beautiful and graceful form of *Chiloscyphus polyanthos*. The *Jubula* could be distinguished by its rather bluish tint. The microscopical examination of this plant showed the leaves to be less spinous-dentate than is usual. The first person to discover this hepatic — in the South of Ireland, about 150 years ago — was Miss Ellen Hutchins (1785–1815), of whom it was said 'she could find anything'. If only there could be more about like her today! The plant was named in her honour by Dr. W. J. Hooker. We also found it in two sites nearby in the Hebden Valley. The only other record for Yorkshire is from Ravensgill, near Pateley Bridge (V.C. 64), recorded by Llewellyn J. Cocks in 1897, and last seen there in April 1950. It was thrilling to think of the associations of this area with the old botanists, it being a place favoured in the past by James Needham (1849–1913) of Hebden Bridge, and of John Nowell (1802–67) the working-man bryologist of Todmorden, and after whom Mitten named the hepatic *Nowellia curvifolia*, seen by us in two places, growing on rotten logs. A quite frequent moss, growing along the banks of the River Hebden was *Atrichum crispum* (James) Sull. (*Catherinea crispa* James), another association with Nowell. Crossland and Needham write in the Y.N.U. circular for the June 1904 excursion: '*Catherinea crispa*, first found in Europe in the Hebden Valley by J. Nowell, is abundant in and about the rocky streams.' Miss M. Dalby informs me that the date given in the records for this is 1860. It is interesting to see it here still over a hundred years later. One enigma of the Hebden Valley is that, in 1904 Mr. W. Ingham said that *Scapania subalpina* seemed to be the dominant liverwort. In 1917 another great hepaticologist, Wm. H. Pearson, visited this locality and wrote ('Hepatics of the Hebden Bridge Valley' — *Naturalist*, April 1918) — 'Mr. Broome and I searched carefully for *Scapania subalpina* Nees, but did not meet with it, although in the report on the visit of the Yorkshire Naturalists to Hebden Bridge in June 1904, it is referred to as the dominant liverwort of the Hebden Valley; all our specimens are *Scapania purpurascens* Hook.' On this day we saw neither of these species, the only *Scapania* collected being a little *S. undulata*. One of the greatest rarities recorded from Hardcastle Crag is *Lophozia atlantica* which we did not see on this occasion. This plant is also associated with James Needham, and I feel that I must quote the following incident from the Presidential Address to the Y.N.U., December 7th 1940, by the late Walter Watson, D.Sc., A.L.S., entitled 'Yorkshire Associations, Lichenological or Otherwise.'

'... I recall one memorable September day in 1912, when, with some other botanists, Hebden Bridge was visited. We took Needham in a cab to Hardcastle Crag on one of the last expeditions he made. Needham was one of the working-men botanists whom we were more familiar with at that time than we are today. He had done much good work with the flowering plants and mosses, but, at the time of our visit, was more interested in fungi. What was supposed to be a new British liverwort, *Lophozia atlantica*, had been discovered at Hardcastle Crag, and we were desirous of seeing it. Needham knew where it had been found and was useful to us in pointing out the particular spot, but could not find the plant. Eventually it was located, a few scraps were taken for specimens, and we descended the slope of the hill. One of our party turned back to verify the particular characters of the slope where the plant occurred. As he was well-known to be rather too keen on collecting for distributing purposes, we all went back with him ... I believe it was W. Ingham, of York, who had first found the plant ...'

We proceeded about two miles up the Hebden Valley, a delightful rocky stream, bounded by woodland, and in places by steep, shaly cliffs, and which is quite unspoiled. Crossing over the river, and returning by road, past the cliffs known as Hardcastle Crag on the right, with a small limestone outcrop from the hillside on our left. This was also a very interesting area, and on the limestone cliff there were

patches of *Zygodon viridissimus* var. *stirtonii*, a new location from that recorded by Mr. H. Walsh 'from the sand and limestone outcrop in Eaves Wood, Heptonstall'. Also in cracks in the cliffs was *Fissidens cristatus*. At least one vice-county record was made at this meeting (another is still awaiting confirmation), viz.: *Fissidens minutulus* var. *tenuifolius* on cliffs at the side of the river, made by myself. There was also a quantity of *Seligeria recurvata* c.fr. on the inside wall of the bridge at Gibson Mill and in several other places and, on sandstone cliffs in several places were patches of *Tetraphis browniana* with numerous capsules showing the four peristome teeth very clearly. *Dicranodontium denudatum* was in several places on tree roots and fallen trunks. Mr. Murgatroyd very kindly pointed out to me *Schistostega pennata* on loose soil under overhanging rocks on the roadside past Hardcastle Crag. This distinct moss (small, about a quarter of an inch high, or less) is impossible to mistake for any other because of the distichous, confluent leaves, which give it a frond-like appearance, much like a miniature fern such as *Blechnum spicant* (Hard Fern). A most striking character of this moss is the highly refractive character of the protonema, which shines with a bright green lustre when viewed from certain angles in the caves and dark holes in which it likes to grow. There are many other bryophytes which I should like to mention here, but enough has been said to show what an intensely interesting place is this delectable valley. The rest of the species seen on this occasion are found consolidated in the following lists.

I am most grateful to the following for examining material and expressing their views: Mrs. J. Appleyard, Mrs. J. Paton, Mr. J. H. Field, Mr. R. D. Fitzgerald, Mr. A. H. Norkett, Mr. E. C. Wallace, Mr. E. R. Little and Mr. M. Corley; and also to Mr. F. Murgatroyd for so ably leading the party.

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Nomenclature follows:

- Census Catalogue of British Hepatics* (4th edition) by J. A. Paton.
Census Catalogue of British Mosses (3rd edition) by E. F. Warburg.

Species found on the limestone outcrop are marked with an asterisk (*).

MUSCI

- | | |
|--|---------------------------------|
| <i>Sphagnum squarrosum</i> | <i>Encalypta streptocarpa</i> |
| <i>S. recurvum</i> | <i>Tortula muralis</i> |
| <i>S. fimbriatum</i> | * <i>Barbula rigidula</i> |
| <i>Atrichum crispum</i> | <i>B. cylindrica</i> |
| <i>A. undulatum</i> | * <i>B. recurvirostra</i> |
| <i>Polytrichum aloides</i> | <i>Gymnostomum aeruginosum</i> |
| <i>P. commune</i> | * <i>Tortella tortuosa</i> |
| <i>Fissidens minutulus</i> var. <i>tenuifolius</i> | * <i>Weissia controversa</i> |
| <i>F. taxifolius</i> | <i>Leptodontium flexifolium</i> |
| * <i>F. cristatus</i> | * <i>Grimmia apocarpa</i> |
| <i>F. adianthoides</i> | <i>Racomitrium fasciculare</i> |
| <i>Ceratodon purpureus</i> var. <i>purpureus</i> | <i>R. lanuginosum</i> |
| <i>Seligeria recurvata</i> | <i>Schistostega pennata</i> |
| <i>Blindia acuta</i> var. <i>arenacea</i> | <i>Tetraphis pellucida</i> |
| <i>Dicranella heteromalla</i> | <i>T. browniana</i> |
| <i>Dicranum scoparium</i> | <i>Orthodontium lineare</i> |
| <i>Dicranodontium denudatum</i> | <i>Pohlia nutans</i> |
| <i>Campylopus pyriformis</i> | <i>P. wahlenbergii</i> |
| <i>C. flexuosus</i> | <i>Bryum argenteum</i> |

MUSCI

**B. capillare*
Mnium hornum
M. punctatum
Philonotis caespitosa
Amphidium mougeotii
 **Zygodon viridissimus* var. *stirtonii*
Fontinalis antipyretica
F. squamosa
Hookeria lucens
 **Neckera crispa*
 **N. complanata*
Thamnum alopecurum
Heterocladium heteropterum
Thuidium tamariscinum
Cratoneuron commutatum var.
 commutatum
Amblystegium serpens
Acrocladium stramineum
A. cuspidatum

**Camptothecium sericeum*
Brachythecium rutabulum
B. rivulare
 **B. velutinum*
B. populeum
Eurhynchium striatum
E. praelongum
E. swartzii
E. riparioides
Pseudoscleropodium purum
Isopterygium elegans
Plagiothecium succulentum
P. sylvaticum
P. undulatum
Hypnum cupressiforme
 **Ctenidium molluscum*
Hycomium flagellare
Rhytidiadelphus squarrosus

HEPATICAEE

Thalloid:

Conocephalum comicum
Riccardia sinuata

Pellia epiphylla
P. endiviifolia

Foliose:

Lepidozia reptans
Calypogeia muellerana
Lophozia ventricosa
Barbilophozia floerkei
B. attenuata
Gymnocolea inflata
Solenostoma triste
S. sphaerocarpum
Nardia compressa
N. scalaris

Plagiochila asplenioides var.
 asplenioides
Lophocolea bidentata
L. heterophylla
Chiloscyphus polyanthos
Cephalozia bicuspidata
Nowellia curvifolia
Diplophyllum albicans
Scapania undulata
 **Lejeunea cavifolia*
Jubula hutchinsiae

A Bryophyte Check-List for Lincolnshire by **M. R. D. Seaward**. Pp. 15.
 Lincolnshire Naturalists' Union 5/- post free. Obtainable from Mr. D. N. Robinson,
 160 Eastgate, Louth, Lincs.

Mr. Seaward's excellently produced and modestly priced check-list will be invaluable to any bryologist working on the flora of the county of Lincolnshire. The check-list follows the pattern set by Peacock in his 'Check-List of Lincolnshire Plants' (*Lincs. Nat. Union Trans.*, 1909). Lincolnshire consists of two vice-counties (V.C. 53 and V.C. 54) and for recording purposes these vice-counties are further subdivided into 6 and 12 divisions respectively. The bibliography and other lists of relevant data are very complete, and it is useful to have all these references together in one publication.

The whole work shows every evidence of very careful preparation and can be thoroughly recommended to all bryologists interested in county lists. G.A.S.

BOOK REVIEWS

Flora of Derbyshire edited by A. R. Clapham. Pp. viii + 382 with 17 photographs, 10 figures and 17 distribution maps. Derby Museum and Art Gallery. 45/-

Active interest in regional systematic botany remains as strong as ever in Britain and several new or revised county Floras have appeared in recent years. W. R. Linton's *Flora of Derbyshire* was published sixty-six years ago and much field-work has been done in the intervening years resulting in such a substantial accumulation of facts as to require an entirely new Flora rather than a supplementary list of records. The present work was initiated by a committee which first met twenty years ago and the completion and publication of the work is a notable example of effective co-ordination of field, library and herbarium work of a team of contributors under expert guidance and editorship.

A feature of particular botanical interest which Derbyshire shares with Yorkshire is its position as a meeting ground for northern and southern species. Despite its much smaller area it is geologically diversified and this is reflected in the richness of its flora. About one quarter of the book is occupied by introductory chapters giving detailed information on the geology, geomorphology, climate, and vegetation of the county contributed by W. H. Wilcockson, Prof. R. S. Waters, Prof. Alice Garnett and Dr. T. T. Elkington respectively. The chapter on vegetation includes 84 habitat studies giving detailed information on the composition of the flora in selected habitats characteristic of the magnesian limestone, coal measures, millstone grit, carboniferous limestone and the triassic and alluvial deposits of the southern lowland regions. A further chapter on geographical distribution by Dr. Elkington includes distribution maps of seventeen selected species and the volume is further enhanced by seventeen excellent photographs of species and scenic features.

In the floristic part of the work one kilometre (four-figure) grid references are given for each station save for the generally distributed species where absence in any 10 km. square is noted. Such recording is more precise yet more economical in space than traditional methods. For each species also, records are appended from Linton's Flora — with 10 km. references added to each locality — and this permits some comparison of past and present occurrence and distribution. There is a further notable improvement on the earlier work in the much more accurate habitat data given for most species, often supplemented for the more interesting species such as *Polemonium caeruleum* and *Vaccinium intermedium* by ecological data and information about characteristic associated species. All records for aliens and casuals are included and these are not distinguished typographically from native species. The accounts of the genera *Rubus*, *Hieracium* and *Euphrasia* have each been revised by the appropriate specialist.

It is a pleasure to welcome this excellent addition to the series of county Floras. Not only is the valuable store of information which it contains up-to-date, but the manner in which this information is assembled and made available is in line with the best modern trends in the production of such a work.

W.A.S.

Drawings of British Plants: Part 26 by Stella Ross-Craig. Bell and Sons Ltd. 16/-.

The latest part of Stella Ross-Craig's great undertaking contains forty-eight plates covering the seven families Polygonaceae, Thymelaeaceae, Elaeagnaceae, Loranthaceae, Santalaceae, Euphorbiaceae and Buxaceae. Since four of these families are represented in Britain by single species the interest of this part centres mainly round the illustrations of Polygonums, Docks and Spurges. As always, her drawings combine accuracy with elegance and give aesthetic satisfaction as well as detailed information about the plants portrayed. The drawings of the fruiting perianths of the Docks, whole and in sectional view, and the enlarged cyathea, fruits and seeds of the Spurges are especially valuable for purposes of identification. The illustrations of whole plants of Docks, reduced to one eighteenth of natural size, leave little scope however for conveying the individuality of the species. Following the illustration of Knot grass, *Polygonum aviculare*, mention is made of three other 'variants of this species'. All three are treated as distinct species in *Flora Europaea* and their claims to recognition are scarcely less sound than those of some *Salicornias* illustrated in the previous part. The illustration of *Polygonum hydropiper* also does not show the characteristically nodding inflorescence of this species. These are small points however to set against the high standard of these drawings and all botanists will wish the artist a smooth and uninterrupted passage over the remainder of her long and exacting journey.

W.A.S.

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THE NATURALIST

A Quarterly Journal

of Natural History for the North of England

Edited by

W. A. SLEDGE, Ph.D., B.Sc., The University, Leeds

with the assistance as referees in special departments of

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THE NATURALIST

FOR 1970

INTRODUCED FORMS OF THE RED SQUIRREL IN SOUTH YORKSHIRE AND NORTH DERBYSHIRE

T. M. CLEGG

City Museums and Art Gallery, Dundee

In recent years the relationship between the native Red Squirrel, *Sciurus vulgaris*, and the introduced American Grey Squirrel, *Sciurus carolinensis*, has interested naturalists. The dramatic decline in numbers and range of the former, and the dynamic spread of the latter, have been analysed and chronicled by such workers as Monica Shorten (1954 and 1962) on a national scale, and in the Sheffield area of Yorkshire by David Spalding (1966) who discussed the local status of the two species in the decade 1955-65. One point which has often not been mentioned concerns the racial forms of the Red Squirrel which have been the subject of recent observations.

The British race of the Red Squirrel, *Sciurus vulgaris leucourus* Kerr, characterised by its rather small size and its straw-coloured tail in summer pelage, is sufficiently well differentiated to be illustrated in van den Brink's (1967) *Field Guide to the Mammals of Britain and Europe*, and was regarded as a separate species by Barrett-Hamilton (1910-21). During the course of this study I examined such material as is available in Yorkshire Museums in order to ascertain whether specimens of this race were still being received. On the basis of my own field observations and of records received from a number of West Riding observers, I suspected that this was not likely. In the collections of the Yorkshire Museum at York, a short series of skins mainly collected before 1910 were referable to *leucourus*. A number of these were actually taken in the museum gardens around the turn of the century. The most recent record of *leucourus* in Yorkshire was of a skin dated June 1938 from Almondbury, Huddersfield, collected by E. F. Gilmour. This was badly damaged by moths and was destroyed in 1963.



Fig. 1

Specimen from Chatsworth Park, Derbyshire, cf *S. v. fuscoater* Altum.

Other specimens which I was able to examine in the Leeds, Sheffield and Huddersfield collections were not referable to the native race and their characters suggested that they might belong to any of a number of Continental forms. In 1965 two such specimens came to hand, one, a mounted dark phase animal from Chatsworth Park, Derbyshire (Fig. 1), and the other, a freshly dead individual from Wentworth Woodhouse near Rotherham (Fig. 2). These I sent to Dr. G. B. Corbet at the British Museum (Natural History) for examination, and he compared them with European material in that collection and commented as follows. The Chatsworth Park example was a very dark animal and was typical of the form *S. v. fuscoater* Altum, agreeing closely with animals from Germany, Switzerland and the French Alps and also with animals from Yugoslavia, Russia and parts of Asia, though these had been described as other races. As a point of interest it also agreed very closely with the second generation cross between a dark phase animal from Germany and an albino British Red Squirrel. In order to obtain some possible dates for the introduction of Red Squirrels to the Chatsworth Estate I contacted Mr. H. E. G. Read, the Estate Agent. Possible sources of European squirrels may have been the great glass house and pinetum of the 6th Duke of Devonshire in the late 18th century, or more likely in the 1920's and

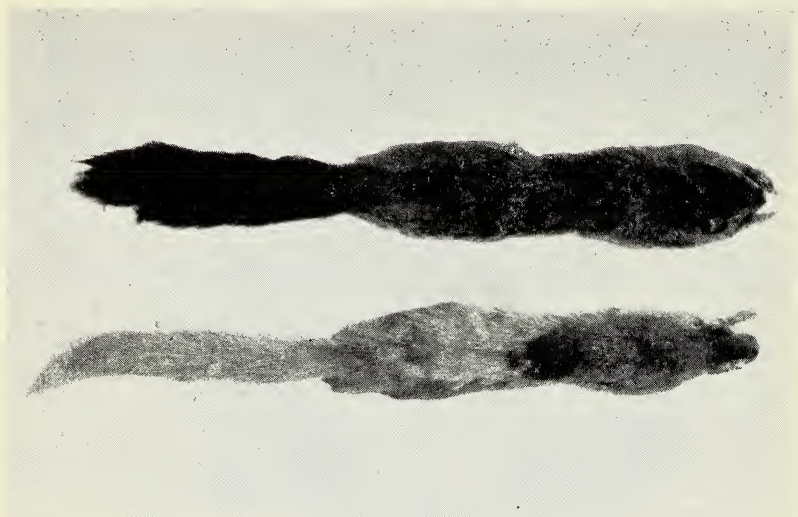


Fig. 2

Upper specimen from Wentworth Woodhouse, cf *S. v. numantius* Miller. Lower specimen of *S. v. leucourus* Kerr, from Rothiemurchus Forest, Inverness, June 1962.

1930's when squirrels from the Continent were kept in cages at Chatsworth. The proximity of the two 1965 Red Squirrel specimens to great houses suggested that examining their records for possible dates of introduction might be profitable.

The Wentworth specimen, a dark male, killed on 18th September, 1965, and now preserved as a study skin in the Doncaster Museum collection, was examined with the following result by Dr. Corbet. The grey ventral pelage of this specimen was not matched by anything in the British Museum's collection, but otherwise it was closest to *S. v. numantius* Miller, from France and Northern Spain. It also matched a specimen collected at Hainault, Essex in 1949. The implication here is of course that introductions have taken place from Europe to southern England, and in fact that is mentioned by Monica Shorten. Some of these animals then appear to have been transmitted elsewhere in England. Animals from the Aldershot area released at Hebden Bridge, Halifax, in 1942, had increased locally by 1945 and were still present, though

scarce in 1963 and 1964 (Y.N.U. Annual Reports). The only slender lead as to the origin of the Wentworth specimen led to Earl Fitzwilliam's menagerie of the early nineteenth century. However, dark phase animals, also obvious introductions, are frequent on the Estate's land in the Bradfield area near Sheffield and have been seen at Grenoside also. One of these provided the only record of melanism noted by Spalding.

The dimorphism of the European races of *S. vulgaris* is marked, and all the races likely to have been introduced to England have dark phases. The latter often look black in the field, and dark or 'chocolate' coloured animals are often seen in the Barnsley-Huddersfield-Wakefield triangle, where the species appears to be at its most numerous in south-west Yorkshire.

From the few museum specimens extant, the annual reports of the Yorkshire Naturalists' Union and widespread enquiries amongst individual naturalists and societies, it would appear likely that all the Red Squirrels in vice-county 63 are of introduced origin, though the species is still quite widespread in the area as the

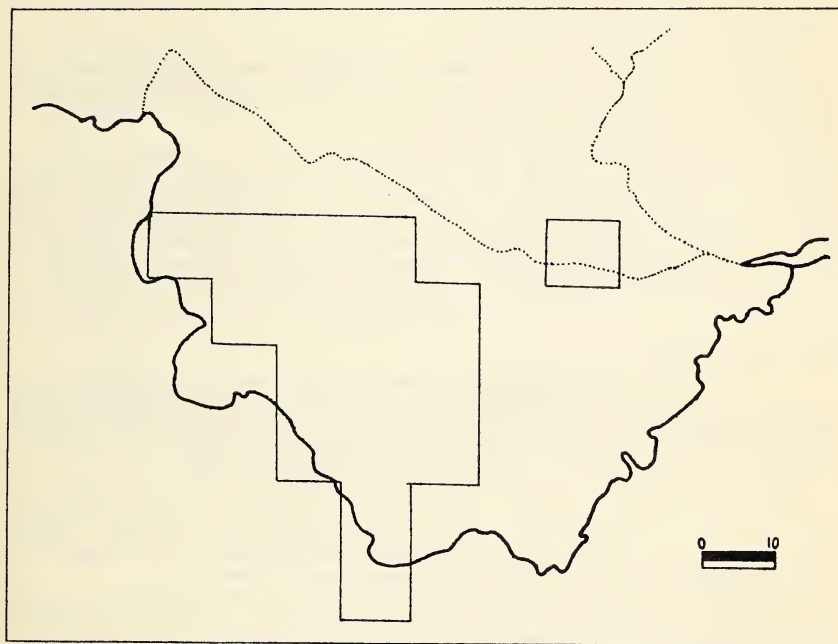


Fig. 3

Distribution of Red Squirrels in vice-county 63, based on 10 km squares.

accompanying map (Fig. 3) shows. On this all the 10 km. grid squares for which records have been noted since 1940 are shown. The difficulty with which definite data were obtained for these notes underlines once again the need for introductions of any animal species to be recorded in print, for specimens to be deposited in museum collections and for the field naturalist to be aware of the possibility of one racial form being replaced by another, without a discernible break in a species' occupation of an area.

ACKNOWLEDGEMENTS

My thanks are due to Mr. C. J. Devlin of Doncaster Museum, who photographed the specimens and to Miss M. J. Webb of Dundee City Museums, who prepared the map. I would also like to express my gratitude to Dr. G. B. Corbet of the British

Museum (Natural History) for his examination of and comments on the Red Squirrel specimens described.

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BIRD NOTES

Pure-white Cormorant at Ravenscar

While counting the nesting pairs of Cormorants (*Phalacrocorax carbo*) in the small colony on the cliffs at Ravenscar on 20th July 1969, C. R. Clark was the first to notice a pure white bird on one of the ledges.

It was watched for some time by two of us through 12 × 50 binoculars, but as the nest was some 150 ft. above the shore full details were not possible. It was clearly a young bird though it was virtually the same size as its two normally plumaged parents standing beside it. A second visit was made two days later when the bird was studied by the three of us through a × 40 telescope.

It was not, even then, possible to say with certainty that the bird was a true albino. When the eyes were closed there was a definite pink coloration around the eye, but when open it showed a dark colour. The beak was pale and almost colourless; the gular pouch was yellow though paler in shade than in the adult birds; the whole of the feathered parts were creamy white, no trace of any dark colour showing when the bird stretched its wings or raised its tail to evacuate over the edge of the nest. Because of the height of the site above us it was not possible at any time to see the colour of the legs and feet.

R. H. APPLEBY, C. R. CLARK, A. J. WALLIS.

Ducks on a Pond

It is a well-known principle that more can be seen by watching constantly at one place in preference to rushing hither and thither from one likely locality to another. Watching at the Narrow Neck at Spurn is a well-tried example of this theory, and the Pied-billed Grebe (*Podilymbus podiceps*) near Harrogate was found because of a constant, daily look at a reservoir which is not renowned for birds.

This spring, a day of heavy rain filled a small pond on the outskirts of Scarborough so that, for the first time, it became really obvious from the road nearby. That day, 21st March 1969, it had three ♂♂ and two ♀♀ Teal (*Anas crecca*) and one ♂ Wigeon (*Anas penelope*) on the water, with two Oystercatchers (*Haematopus ostralegus*) and about 50 Lapwings (*Vanellus vanellus*) feeding on the shore line.

The pond is just a hollow in the centre of a grass field, and at its fullest not more than 40 ft. in diameter either way. It is about half a mile in a straight line from the coast; about quarter of a mile from a row of houses, the last in Scarborough; and a road runs along one side of the field.

From 21st March to 9th May 1969 the pond was checked each morning, usually between 8 and 9 a.m. as I went to work. I had to miss six mornings but during the period it was visited by 25 species of birds, all associated with water or wet places.

The list is as follows:—

Little Grebe (*Podiceps ruficollis*)—One appeared on 26th April and was still present the following day.

Mallard (*Anas platyrhynchos*)—Curiously Mallard was the last of the ducks to visit the pond, and then only a ♂ on 25th and a ♂ and two ♀♀ on 27th April.

Teal (*Anas crecca*)—From the first date, 21st March, the daily number fluctuated with a maximum of nine, until 4th April when a pair stayed and was there almost every day until 21st April.

Wigeon (*Anas penelope*)—After the single ♂ on 21st March four were present on 24th March for four days, two for six days, and one for a further three days until 5th April.

Shoveler (*Spatula clypeata*)—A single ♂ on 24th April.

Tufted Duck (*Aythya fuligula*)—Two ♂♂ and a ♀ from 12th to 24th April.

Shelduck (*Tadorna tadorna*)—A single bird on 30th March and again on 4th April.

Grey Lag Goose (*Anser anser*)—One on 27th March, a lone bird, but on 3rd April one was present with a White-fronted Goose (*Anser albifrons*). Both birds seemed obviously wild and wary, and eventually flew off, perfectly full-winged, to the north. However doubts that they were escaped birds from some ornamental collection crept in when one of each species (possibly the same two birds) turned up again at the pond on 8th May.

Bewick's Swan (*Cygnus bewickii*)—An adult and two juveniles were present on 22nd March only.

Moorhen (*Gallinula chloropus*)—It was not until 8th April that the first two appeared, possibly coming across the field from a nearby ditch. From then until the pond dried out and grass and sedges around it grew so much that it became invisible from the road and made observations impracticable, one or two were present on most mornings, and in the latter part of the period were seen to be nest building.

Waders—Eight species of wader visited the pond, though only the Redshank (*Tringa totanus*) was present with any regularity, from one to five being seen on 16 dates spread over the period. The other species were—Oystercatcher, two on 21st March and one the following day; Lapwing, about 50 on three dates in March, though on other mornings the same birds were obviously feeding on a neighbouring field, with six, the last, on 8th April; Ringed Plover (*Charadrius hiaticula*), one on 9th April; Snipe (*Capella gallinago*), one on 30th March, though up to twelve spent the first two weeks of April at a marshy corner of a field not 200 yards over a rise in the land; Curlew (*Numenius arquata*), two on 22nd March; Common Sandpiper (*Tringa hypoleucos*), one on 27th April; Dunlin (*Calidris alpina*), three on 27th March.

Gulls—With the town rubbish tip across the road and about 800 yards away the pond was a favourite place for bathing and preening, with sometimes sizeable mixed flocks of the four common species resting on the surrounding field. The only unusual gull (for this district) was the Lesser Black-backed Gull (*Larus fuscus*), and single birds were present on three dates in the latter half of April.

Black Tern (*Chlidonias niger*)—On an afternoon visit on 25th April one was hawking flies over the pond, but it had gone by the following morning. This was one of several seen in the Scarborough district during the spring, a bird which is not as regular here as it is further inland in the county.

As the grass and sedge growth around the pond died down in the autumn observations from the road again became possible and further species will no doubt be added to the above list. In fact a Heron (*Ardea cinerea*) was one of the first birds seen when it again became worthwhile going that way to work.

A. J. WALLIS

Unusual Nest-site for Turtle Dove

On 29th June 1969, an adult Turtle Dove was flushed from a small hawthorn bush close beside a footpath along which I was walking near Cridling Stubbs, and attracted my attention to its nest containing two young. The fact that the birds had managed to raise young at all was, in the circumstances, surprising.

The nest was clearly visible from a busy road no more than fifteen yards away and the nest itself was only three yards from the footpath. More remarkably the birds had chosen a small hawthorn whose maximum height was seven feet, and the nest was in an exposed position in the lower branches about three feet from the ground. As the hawthorn stood on one bank of a ditch whose far bank was raised, the nest was in fact *below* the ground level of the opposite bank only two yards beyond it. There were one or two small alder trees along the same length of ditch but no continuous hedge and the hawthorn was in fact a comparatively isolated bush.

The area generally is one with a number of woods and copses alternating with agricultural land and supports quite a good population of the three usual doves, to which Collared Doves have recently been added. That this pair of Turtle Doves had used a low position clearly visible in an isolated hawthorn close to public access and well away from the nearest wood may perhaps indicate unusual competition for nest sites.

The nest and young were subsequently inspected and photographed by R. F. Dickens and the two young successfully fledged on 9th July.

GEOFFREY WALLIS, 52 *Smithson Avenue, Townville, Castleford.*

Savi's Warbler at Knaresborough

At 20.30 hours on the evening of 14th May 1969, Mrs. Jean Brown was standing outside the ringing laboratory at Knaresborough Ringing Station (David Brown and Robert Evison were inside), when she heard a short burst of reeling song from a patch of thick undergrowth nearby. It had been raining heavily with a severe thunderstorm just prior to this. She was familiar with the song of Grasshopper Warbler (*Locustella naevia*) and knew it was not that species. D.N.B. and R.E. were summoned and the bird sang four more times. They were unable to see the bird and as the light was deteriorating, left the area until the following morning. R.E. suspected the bird was a Savi's Warbler (*Locustella inscinioides*) and was at the Station next morning at 05.00 hours.

He heard the song again and managed to see the bird which was sitting in full view amongst broken reed mace stems and willow scrub. Through binoculars it was seen to resemble a Reed Warbler (*Acrocephalus scirpaceus*) in general coloration, being completely unstreaked. The song was a low pitched reel, delivered in short bursts of about 3 to 5 seconds.

A mist net was erected within 10 feet of the singing bird and whilst one end was being unfurled the bird flew into it and bounced out again. R.E. then went to contact John R. Mather who arrived at the site at 06.00 hours. The song was not heard for the next half hour but the bird eventually sang from a thick patch of bramble some 100 yards further up the river. It sang several times during the next half hour in typical short bursts, at one time only a few feet from the observers but concealed in thick cover.

J.R.M. knows the species well and was able to confirm Robert Evison's identification. Full details were submitted to the *British Birds* rarities committee who accepted the record. It was a new species for the county and coincided with the occurrence of one at Cley in Norfolk on the 16th May and single birds at three localities in Kent and in one other county on the same date.

JOHN R. MATHER

Warbler coming aboard Ship in mid-Atlantic

In the course of my work as an engineer on tankers in the Merchant Navy I see a lot of sea-birds in my off-duty time. I also keep a look-out for any migrants which may alight aboard, which they quite frequently do. It is unusual however for a small land bird to come aboard about a third of the way across the Atlantic.

My most recent crossing was from one of the many crude-oil supply ports in Venezuela to a refinery near Oslo, a journey of nearly four and a half thousand miles and of eleven and a half days duration. We took a great circle course east of Bermuda, well into the North Atlantic, then north of Scotland and on across the North Sea to Norway. At about 09.00 on 9th September 1969, nearly four days out from Venezuela I was told that three small birds had been seen to land on the fore-deck. It was not until just before I went on watch again in the afternoon that I was able to locate one of them which I identified as an immature Wilson's Warbler (*Wilsonia pusilla*). It was later caught by an enthusiastic member of the crew but died in the evening presumably as a result of exhaustion and/or shock.

Wilson's Warbler is a tiny bird about the size of our Willow Warbler but much brighter in colour. Lacking any real distinctive features in the immature plumage, its upper parts are olive green and its under parts bright yellow with no wing bars or streaks and without the spotting on the tail of the other closely similar warblers.

It struck me that the distance from the nearest land must be quite exceptional for so small a bird so I checked our position for 09.00 that morning. It had been 33° 58' N., 55° 32' W. and I was amazed to find that the nearest landfall was Bermuda some 480 miles W.S.W. of us. As the wind had been blowing predominantly from the north-west and had been fairly strong (force 5), it is safe to assume that the birds' flight had not originated in Bermuda. It is much more likely that they had set out from Nova Scotia or the north-eastern part of the United States in either of which cases they would have flown some 780 miles over sea. Other than Bermuda, landfalls would be nearest at Puerto Rico (1,000 S.W.), Azores (1,500 E.N.E.). The U.K. is some 2,500 miles N.E.

Wilson's Warbler nests in marshy areas from north Quebec and north Manitoba as far south as the northern parts of Maine, New Hampshire and Minnesota. The species winters in Central America.

ADRIAN CHAPMAN, 89 Gypsy Lane, Townville, Castleford.

CORRESPONDENCE

Dear Sir,

A Century of Bird Protection

The earliest reference to bird protection in the article on the above by R. F. Dickens (*Nat.* 83-4, 1969) is a letter from the Rev. F. O. Morris in *The Times* for 17th October 1868.

I have a copy of *History and Antiquities of Filey* by John Cole, published in 1828. In the chapter on Sea Fowl on the cliffs of Filey is the following:

'The spirit of humanity dictated the drawing up, and circulating in the neighbourhood the following bird-protection [notice].

'As this is nearly the season in which young men, thoughtlessly (to use the least offensive expression), occupy their watering-place leisure in shooting Sea-fowl, may it be permitted to offer, on behalf of these poor animals,

A FEW WORDS FOR HUMANITY?

'As we drew near a promontory, where the rocks are lofty we found them inhabited with thousands of Sea-fowl of different kinds. I was greatly amused with seeing the variety of their busy actions, and different modes of flight; and with hearing the harsh notes of each when single, and their varied tones changed into a sort of wild harmony by the clangour of all together. One would have thought that a colony like this, might have been safe from all annoy. They are useless when dead, and harmless while alive. We saw, however, as we proceeded, two or three boats anchoring at different distances, in which were certain savages — I can tell them by no other name — diverting themselves with shooting these poor birds, as they flew from their nest, or returned to them with food from the sea; destroying not only the parent birds, but leaving their hapless progeny to clamour in vain for food, and die of hunger! This mode of taking life for no end is a species of cruelty which I should wish to brand with the severest name.' — *Gilpin's Dialogues on the amusements of Clergymen*.

'The writer might have added, that this 'amusement' has not even the poor pretext of improving the gunner's skill, which is sometimes alleged in excuse for shooting swallows, as they sport themselves during their short summer in skimming about the air, and without doing injury of any kind pursue only their own little excursions, and catch the food which Providence has allotted them. He might also have added, that while the young are left to 'die of hunger' upon the rocks above, the old are often left broken-winged and wounded to float about in agony for several days, perhaps, on the waves below! Can there be a greater accumulation of gratuitous cruelty? Can any man of common sense and humanity, make, or accompany a party to shoot Sea-fowl?

F.W.'

A. NORMAN HANDLEY, 30 Lee Green, Mirfield, Yorks.

Dear Sir,

The Sea Birds Preservation Act, 1869: The Parliamentary Process

Following the recent interesting article on the Sea Birds Preservation Act, 1869 (*Nat.* 83-4, 1969), the following note gives an account of its passage through Parliament. It is based on the Hansard records of the time and I am indebted to the Librarian of the House of Commons Library for making available photo-copies of the relevant parts of Hansard.

'On February 26 1869, Mr. Christopher Sykes, the second son of Sir Tatton Sykes of Sledmere and M.P. for the East Riding rose in the House of Commons to beg leave to present the Sea Birds Preservation Act. He did so in response to widespread alarm at the continuing and widespread disappearance of sea birds from the coast, not only of the East Riding, but also as far south and west as Devon and Cornwall. He reminded the House that in the 25th year of the reign of Henry VIII, a strict law had been passed protecting sea birds in the breeding season and now, especially on behalf of three important groups within his own constituency, representing others to be found in

every seaboard country—the farmers, the merchant seamen and the deep-sea fishermen—he was presenting this bill.

‘Mr. Sykes offered to the House a letter from a Filey farmer, who, living within a mile of the coast, had not seen a single bird on his farm, and then drew attention to the valuable service given by the sea birds to sailors in foggy weather by giving audible warning of the rocky coastline and earning for themselves the name of the “Flamborough Pilots”, and finally the service in helping fishermen locate shoals of fish. In this respect he recalled that the Isle of Man legislature had recently imposed a £5 penalty on every man who wilfully killed or destroyed a seagull. Mr. Sykes ended his speech by suggesting that the visitors too would also rue the loss of the sea birds.

‘At the second reading of the Bill, sponsored by Mr. Sykes, Mr. Clay (M.P. for Hull) and Mr. Ward Jackson (M.P. for Hartlepool) an amendment extending the protection not only for the birds, but their eggs too, was carried. In further discussion an unsuccessful attempt was made to have Scotland excluded and the complaint made that anyone could ask for the name and address of a person suspected of infringing the Act. If such a person refused to give his name and was subsequently convicted he was liable to an additional penalty of £2, half of which went to the informer!

‘However it was left to the Lords’ debate to indicate more precisely how the decreases were being brought about. The Duke of Richmond reminded their Lordships that large numbers of people went down in the breeding season by excursion trains for the sole purpose of shooting the sea birds at their breeding sites, while the Archbishop of York pointed out that many too were shot for the sale of their plumage to adorn ladies hats. Their Lordships struck out Clause 4 relating to the Penalty for selling sea birds eggs—a clause which had survived lively debate in the Commons. Following the Lords’ Debate on 4th May 1869, the Bill progressed rapidly and received the Royal Assent on 24th June 1869.’

H. T. JAMES, 238 Sigston Road, Beverley.

CHISLETT MEMORIAL LECTURE

The fifth Chislett Memorial Lecture was held in the Geology Lecture Theatre, Leeds University, on Saturday, 27th September 1969, under the chairmanship of Miss C. M. Rob, President of the Union. Dr. F. H. Perring, head of the Biological Records Centre of the Nature Conservancy, Monks Wood near Huntingdon, took as his subject ‘Recording Britain’s Wildlife’. Dr. Perring was for ten years, from 1954 to 1964, connected with the B.S.B.I. Distribution Mapping Scheme and was co-editor with Dr. Max Walters of the *Atlas of the British Flora* and editor of the Critical Supplement thereto published in 1968.

Dr. Perring first traced the history of botanical recording in Britain from the early days when both recorders and records were few, to the present time when most of the country is covered by county or local floras. H. C. Watson’s introduction of the province and then the vice-county system was explained and the advantages of retaining the vice-county concept, into which the current use of the national grid system conveniently fits, was emphasised. Although botanists were first in the field with modern recording methods many other branches of natural history are now using these methods and their co-ordinated results when available will add substantially to our understanding of the distribution of Britain’s wild life. He emphasised that the Biological Records Centre, which represents a great pool of information channelled into it by active field naturalists, is always ready to pass out its records and information to enquiring field workers. Details were given of specific schemes of ‘network research’ which has been organised by the Centre, including the *Symphytum* Survey and the plans at present being developed for detailed attention to the distribution of Holly and Mistletoe — two species on which observations can readily be made by botanists during the winter period.

Mrs. Joan Duncan, expressing the thanks and appreciation of the meeting to Dr. Perring said his lecture would do a great deal to stimulate all sections of the Union. She also thanked the University authorities for allowing the use of the lecture theatre.

THE LEPIDOPTERA OF YORKSHIRE

(concluded from 1969, p. 126)

Z. loniceræ Esp. (Narrow Bordered Five-spot Burnet).

Another widely distributed but local species.

61. Filey; Kilnsea; Thixendale.
62. Scarborough; Strensall Common.
63. Halifax; Seckar Wood near Barnsley; Wakefield.
64. Harrogate; Selby district.

Z. trifolii Esp. (Broad Bordered Five-spot Burnet).

There are two unconfirmed reports of this species, which, as Porritt pointed out, is easily confused with *Z. loniceræ*; its presence in Yorkshire remains doubtful.

Procris geryon Hubn. (*Cistus* Forester).

Very local but firmly established in a few localities.

61. Millington, 1933; Thixendale.
62. Pickering, in Gundale.
64. Arncliffe; Gordale, 1915; Grassington.

P. statice Linn. (Forester).

Not as common as it used to be, probably some of its habitats have been destroyed.

61. Allerthorpe Common; Market Weighton; North Cave; Skipwith Common.
62. Seamer; Strensall Common, 1953.
63. Balne Ponds; Methley, 1943; Napton Springs near Huddersfield; Riddleston near Keighley, 1936; Hatfield Moors; Thorne Moor.
64. Askham Bog, 5th June 1960; Harrogate, 20th June 1966; Selby district; Washburndale.

SYNTOMIDAE

Syntomis phegea Linn. (Nine-spotted).

Not recorded since Porritt's List.

SESIIDAE

Dipsosphesia scopigera Scop. (Six-belted Clearwing).

Not recorded since Porritt's List.

Aegeria formicaeformis Esp. (Red-tipped Clearwing).

The only record since Porritt's List is from the York district (62) on 15th June 1947.

A. culiciformis Linn. (Large Red-belted Clearwing).

Fairly widely distributed among birch, the larvae usually being found in the stumps after the trees have been felled.

61. Allerthorpe Common, 1926.
62. Strensall Common, 1917.
64. Bishop Wood, 1959 and 1962; Camblesforth; Temple Newsam, sometimes common.
65. Copley.

A. myopaeformis Borkh. (Small Red-belted Clearwing).

Not recorded since Porritt's List.

A. vespiformis Linn. (Yellow-legged Clearwing).

Local and not often recorded but like all members of this family it is seldom observed unless specifically worked for.

63. Sandal near Wakefield, 1948.
64. Bishop Wood, formerly; Selby, in woods south of the town in 1951 and 1952.

A. tipuliformis Clerck (Currant Clearwing).

Fairly well distributed in gardens.

63. Shipley, 1943; Wakefield.
64. Gledhow near Leeds, 1953; Selby district; York district.

A. spheciformis Schiff. (White-barred Clearwing).

Not recorded since Porritt's List.

Sesia apiformis Clerck (Poplar Hornet Clearwing).

Not recorded since Porritt's List.

Sphacia bembeciformis Hubn. (Lunar Hornet Clearwing).

Fairly well distributed and more often reported than almost any other Clearwing, being much more conspicuous.

61. Hornsea Mere; Hull.
62. Great Ayton.
63. Halifax; Little Horton near Bradford; Skelmanthorpe.
64. Grassington; Chapel Haddlesley; Harrogate; Leeds; Selby; Ulleskelf.

COSSIDAE

Zeuzera pyrina Linn. (Leopard).

Not infrequently reported and quite widely distributed.

61. Hull; Skipwith Common.
62. Bootham, one, 2nd July 1953.
63. Barnsley; Clayton West; Doncaster; Guiseley, 23rd July 1943; Little Horton; Horbury; Skelmanthorpe, 1918; Thorne Moor.
64. Askham Bog; Bishop Wood; Knaresborough; Leeds, 9th July 1960; Rombalds' Moor, 1939; Selby; York.

Cossus cossus Linn. (Goat Moth).

Less common than formerly and certainly less often reported than the previous species.

63. Doncaster, 1941 and larvae in Woodlands district in the early 1960's; Bretton Park, 1904.
64. Leeds, one pupa in July 1930.

HEPIALIDAE

Hepialus hecta Linn. (Gold Swift).

Fairly well distributed, mainly in woods among bracken.

63. Deffer Wood; Edlington Wood.
64. Arncliffe; Bishop Wood; Grass Wood; Guyscliffe near Summerbridge; Harrogate; Selby area.

H. lupulina Linn. (Common Swift).

Common and generally distributed.

H. fusconebulosa Deg. (Map-winged Swift).

Widely distributed, but mainly in the hillier districts.

61. Skipwith Common, scarce and of recent occurrence only.
62. Hackness near Scarborough.
63. Deffer Wood; Elland; Little Horton; Huddersfield; Haw Park near Wakefield; Shipley.
64. Grassington; Harrogate; Kirkstall; Leeds.

H. sylvina Linn. (Orange Swift).

Also widely distributed, but there are more records from low-lying areas than for the previous species.

61. Barlby; Hornsea Mere; Kilnsea.
62. Hutton-le-hole.
63. Deffer Wood; Huddersfield; Shipley; Skelmanthorpe; Wakefield; Wombwell.
64. Bentham; Buckden; Grass Wood; Knaresborough; Leeds; Selby.

H. humuli Linn. (Ghost Swift).

Generally distributed and often common.

Corrections and Additions

I. COMPARISON WITH PORRITT'S LIST

Since the object of this paper has been to highlight the changes in the distribution of the Macrolepidoptera in Yorkshire since the turn of the century, the authors have aimed to list all species listed by Porritt even though they have not been recorded since. In the production of the first parts however, in our haste to get something into print, this principle was overlooked. Some species were also omitted from later parts due to the difficulty of cross-checking with Porritt's List in which the species appear in a different order often under unfamiliar names. The paper would not be complete without the following list of species recorded by Porritt and inadvertently omitted

from the body of the paper; their correct positions in the list are indicated by giving the species they follow in parenthesis.

<i>Papilio machaon</i> Linn. (Swallowtail Butterfly).	(First in list)
<i>Lepidea sinapis</i> Linn. (Wood White).	(<i>E. cardamines</i>)
<i>Colias hyale</i> Linn. (Pale Clouded Yellow).	(<i>L. sinapis</i>)
<i>Argynnis lathonia</i> Linn. (Queen of Spain Fritillary).	(<i>A. aglaia</i>)
<i>Euphydryas aurinia</i> Rott. (Marsh Fritillary).	(<i>A. selene</i>)
<i>Plebejus argus</i> Linn. (Silver-studded Blue).	(<i>L. phlaeas</i>)
<i>Hesperia comma</i> Linn. (Silver-spotted Skipper).	(<i>O. venata</i>)
<i>Hyloicus pinastri</i> Linn. (Pine Hawk).	(<i>S. ligustri</i>)
<i>Celerio euphorbiae</i> Linn. (Spurge Hawk).	(<i>H. pinastri</i>)
<i>Stauropus fagi</i> Linn. (Lobster).	(<i>C. vinula</i>)
<i>Clostera curtula</i> Linn. (Chocolate-tip).	(<i>P. bucephala</i>)
<i>Polyplocia ridens</i> Fabr. (Frosted Green).	(<i>A. flavicornis</i>)
<i>Epinaptera ilicifolia</i> Linn. (Small Lappet).	(<i>P. potatoria</i>)
<i>Utetheisa pulchella</i> Linn. (Crimson Speckled Footman).	(<i>A. caja</i>)
<i>Atolmis rubricollis</i> Linn. (Red-necked Footman).	(<i>C. jacobaeae</i>)
<i>Lithosia quadra</i> Linn. (Large Footman).	(<i>C. mesomella</i>)
<i>Eilema deplana</i> Esp. (Buff Footman).	(<i>L. quadra</i>)
<i>E. griseola</i> Hubn. (Dingy Footman).	(<i>E. deplana</i>)
<i>E. sororcula</i> Hufn. (Orange Footman).	(<i>E. sericea</i>)
<i>Graptolitha furcifer</i> Hufn. (Conformist).	(<i>E. transversa</i>)
<i>Heliothis dipsacea</i> Linn. (Marbled Clover).	(<i>P. umbra</i>)
<i>H. scutosa</i> Schiff. (Spotted Clover).	(<i>H. dipsacea</i>)
<i>H. armigera</i> Hubn. (Scarce Bordered Straw).	(<i>H. peltigera</i>)
<i>Jaspidia pygarga</i> Hufn. (Marbled White Spot).	(<i>H. armigera</i>)
<i>Laspeyria flexula</i> Schiff. (Beautiful Hook-tip).	(<i>L. pastinum</i>)
<i>Hypena rostralis</i> Linn. (Buttoned Snout).	(<i>H. proboscidalis</i>)
<i>Itame fulvaria</i> Vill. (Rannoch Looper).	(<i>I. wauaria</i>)
<i>Ennomos autumnaria</i> Wernb. (Large Thorn).	(<i>P. dolabraria</i>)

It should be noted that *Eilema complana* Linn. as listed by Porritt and *E. sericea* Gregs. given in this paper are assumed to refer to the same species.

2. CORRECTIONS

A number of errors inevitably crept into the text, more often than not due to the introduction of the Vice-County system which had not been used for the initial preparation of the records. The following alterations should be made:

Eumenis semele Linn. (Grayling).

The record for Selby should be amended to read: 'A colony established itself temporarily from 1955 to 1958 but the habitat has since been destroyed'.

Leucoma salicis Linn. (White Satin).

Both Drax and Templehurst Wood are in VC 64 and not VC 61.

Sarothripus revayana Scop. (Large Marbled Tort).

Delete the whole note and replace by:

The only authentic record for Yorkshire since Porritt's time is from Strensall Common (62) where it was taken in the 1930's by Arthur Smith'.

Mitochondria miniata Forst. (Rosy Footman).

Sandal Beat is in VC 63 near Doncaster and not in VC 62.

Ammogrotis lucerneae Linn. (Northern Rustic).

Gaisby is near Shipley in VC 63 not near Selby in VC 64.

Anaplectoides prasina Fabr. (Green Arches).

Buttercrambe Wood is in VC 62 and not in VC 61.

Cirrhia gilvago Esp. (Dusky Lemon Sallow).

Elland is in VC 63 and not VC 64.

Cucullia verbasci Linn. (Mullein).

Kirkham Abbey is in VC 61 not VC 64 and Wentbridge is in VC 63 and not VC 64.

Polychrisia moneta Fabr. (Golden Plusia).

This species given as 'very rare in Porritt's time' was in fact not recorded in

Yorkshire in Porritt's time. The first county record was from Robin Hood's Bay (62) by a Mrs. Holmes in 1901.

Scopula emutaria Hubn. (Rosy Wave).

This species was not included in Porritt's List and was added to the county list when first recorded from Kilnsea (61) by F. Emsley on 27th June, 1905.

Nothopteryx polycommata Hubn. (Barred Tooth-striped).

This is not an addition to the county list, it was recorded by Porritt as *L. simulata* and was at first confused with *T. cognata*. Neither of Porritt's records was near Grassington.

Thera cognata Thunb. (Chestnut-coloured Carpet).

This was not included in Porritt's List and all reference to it should be deleted.

3. ADDITIONAL SPECIES

It is pleasing to be able to record that while this list has been in preparation four additional species of Macrolepidoptera have been recorded in Yorkshire for the first time.

Odontosia carmelita Esp. (Scarce Prominent).

A single specimen was recorded at Ampleforth (62) on 5th May, 1968 by Dr. S. L. Sutton.

Arenostola fluxa Hubn. (Mere Wainscot).

(follows *A. pygmina*)

The circumstances of the addition of this species to the county list are remarkable in that two specimens were taken at widely separated localities some three weeks apart by the same collector, Dr. S. L. Sutton: the first at Pilmoor (62) on 12th August, 1968 and the second at Aberford (64) on 4th September, 1968. The second locality was confirmed by a further record in 1969.

Plusia gracilis Lempke.

This species was added to the county list when Mr. J. H. Flint so identified some of the specimens among a series of *P. festucae* taken at Askham Bog (64) in 1969.

Mesotype virgata Rott. (Oblique-striped).

(follows *P. comitata*)

This was added to the list when a single specimen taken in the trap at Spurn (61) in 1969 was recorded by Dr. P. Tannett.

4. ADDITIONAL RECORDS OF SIGNIFICANCE

While the present paper has been in course of preparation a number of additional records which had escaped the recording system have come to light, in particular a paper by R. J. Penrose on the records made at Bootham School in 1953 and 1954. In addition in the past three years there have been a number of important new records, either of well-known species from new localities or of species seldom recorded in the county at all, two being reported for the first time since Porritt's List. Where a record is the first in this list for a Vice-County an asterisk precedes the Vice-County number.

Melanargia galathea Linn. (Marbled White).

61. Warrendale, July 1968.

*64. Hetchell Crags near Bardsey, a single specimen in 1947.

Maniola tithonus Linn. (Gatekeeper).

61. Market Weighton, in fair numbers in 1968.

Coenonympha tullia Mull. (Large Heath).

63. Rawcliffe Moor, rather common, 29th June 1966.

Strymonidia w-album Knoch. (White-letter Hairstreak).

61. Malton area, larvae beaten in May 1967.

Pyrgus malvae Linn. (Grizzled Skipper).

61. South Cave, 31st May 1966 and in 1967.

Thymelicus sylvestris Pod. (Small Skipper).

64. Harrogate, 9th July 1966, more western than any recent record.

Cerura furcula Linn. (Sallow Kitten).

*62. Hackness, 5th July 1967.

Pterostoma palpina Linn. (Pale Prominent).

*62. Bootham, 1953 and 1954.

Dasychira pudibunda Linn. (Pale Tussock).

62. Bootham, 1953 and 1954.

Leucoma salicis Linn. (White Satin).

*61. Driffeld, one, 28th July 1968.

63. Doncaster, 1949.

- Drepana binaria* Hufn. (Oak Hook-tip).
62. Bootham, 4th June 1954.
- Colocasia coryli* Linn. (Nut-tree Tussock).
64. Barwick-in-Elmet, one in 1968.
- Apatele tridens* Schiff. (Dark Dagger).
61. Filey, one larva in September 1967.
- Craniophora ligustri* Fabr. (Coronet).
*61. Driffild, one in 1968.
- Spaelotis ravida* Hubn. (Stout Dart).
63. Doncaster, August 1930.
- Amathes depuncta* Linn. (Plain Clay).
62. Hackness, one at M.V. light, 8th August 1967.
- A. stigmatica* Hubn. (Square-spotted Clay).
*62. Hackness, one at M.V. light, 8th August 1967. This is the first record for over 60 years and confirms that the species should indeed be in our list; previously it was of doubtful authenticity.
- Hadena serena* Fabr. (Broad-barred White).
63. Doncaster, not common.
- Dryobotodes protea* Schiff. (Brindled Green).
64. Bramham, 29th August 1968.
- Apamea scolopacina* Esp. (Slender Brindle).
*62. Pilmoor, one, 12th August 1968.
- A. ypsilon* Borkh. (Dingy Shears).
*62. Bootham, one, 1st July 1954.
64. Selby Common, larvae in 1967.
- Celaena leucostigma* Hubn. (Crescent).
64. Scholes, 24th July 1968.
- Leucania comma* Linn. (Shoulder-striped Wainscot).
*62. Bootham; Strensall Common.
- L. conigera* Fabr. (Brown-line Bright-eye).
*62. Bootham.
- Amphipyra pyramidea* Linn. (Copper Underwing).
63. Triangle near Halifax, 9th September 1968.
- Zenobia subtusa* Fabr. (Olive Kidney).
64. Scholes, one in 1968.
- Omphaloscelis lunosa* Haw. (Lunar Underwing).
*64. Scholes, common on 6th September 1968.
- Xylena exsoleta* Linn. (Sword Grass).
62. Bootham, one, 11th March 1954.
- Cucullia umbratica* Linn. (Common Shark).
*62. Bootham, 1953 and 1954.
- C. chamomillae* Schiff. (Chamomile Shark).
*62. Bootham, 1954.
- Heliothis dipsacea* Linn. (Marbled Clover).
*61. Muston near Filey, one at Ragwort bloom on 14th August 1968 was the first record in the county this century.
- Plusia festucae* Linn. (Gold Spot).
63. Doncaster; Haw Park.
- Catocala nupta* Linn. (Red Underwing).
62. York, 5th October 1954.
- Zanclognatha tarsipennalis* Treirs. (Fan-foot).
*62. Bootham, one in 1954.
- Brephos parthenias* Linn. (Orange Underwing).
*62. Strensall Common in 1953 and 1969.
- Pseudoterpna pruinata* Hufn. (Grass Emerald).
*62. Strensall Common in 1954.
- Iodis lactearia* Linn. (Little Emerald).
61. Cliffe Common, a few in 1968.

Scopula ternata Schrank. (Smoky Wave).

*61. Levisham, 15th June 1968.

64. Washburndale, common on high ground in 1968.

Lobophora halterata Hufn. (Seraphim).

62. Strensall Common, one on 9th June 1968 seems to confirm that it is established there.

Lygris prunata Linn. (Pheonix).

*62. Ampleforth, 24th August 1968.

*63. Triangle near Halifax, 1968.

L. pyraliata Schiff. (Barred Straw).

*62. Bootham, 1953.

Thera juniperata Linn. (Juniper Carpet).

*64. Harrogate, two specimens on 15th and 22nd October 1968 are the first reported this century.

Xanthorhoe munitata Hubn. (Red Carpet).

64. Kingsdale near Ingleton.

X. spadicearia Schiff. (Red Twin-spot Carpet).

61. Muston near Filey, 1967.

62. Hackness, 1967.

Perizoma alchemillata Linn. (Small Rivulet).

*62. Bootham, 1954.

P. flavofasciata Thunb. (Sandy Carpet).

*62. Bootham, 1954.

64. Malham, 1968.

P. bifasciata Haw. (Barred Rivulet).

61. Skipwith Common, 19th July 1968; the third locality to be noted and the first away from the coast.

Eupithecia centaureata Schiff. (Lime-speck Pug).

*62. Bootham, 1953 and 1954.

E. virgaureata Doubl. (Golden Rod Pug).

61. Thixendale, larvae on 10th September 1966.

E. exigua Hubn. (Mottled Pug).

*62. Bootham, 1953.

Abraxas sylvata Scop. (Clouded Magpie).

63. Barnsdale Bar, larvae common in September 1966.

Gnophos obscurata Schiff. (Annulet).

62. Ravenscar.

Selenia lunaria Schiff. (Lunar Thorn).

64. Malham Tarn, 13th June 1966.

Apeira syringaria Linn. (Lilac Beauty).

*63. Doncaster, three in 1945.

5. ACKNOWLEDGEMENTS

It was explained at the beginning that this paper was produced by team-work and that for this reason it does not bear the name of an individual author. It was our earnest desire to make the general situation available as quickly as possible so that we could then concentrate our studies on those species whose status in Yorkshire is of the greatest significance. As space was limited we therefore dispensed with the tradition of giving names or even initials for each record as this would have considerably extended the number of pages needed and added nothing to the intelligence contained in the paper. This anonymity however in no way reduces the gratitude we owe to all those whose records have been received by the county recorder over the years; for those who wish to follow up a detail, the records are on the cards and the names of those who made the original reports are there recorded. To them must go our prime acknowledgement. Secondly we must mention the work of Mr. F. W. Hewson who built up the most extensive card index over the years 1956 to 1962. In the latter year Mr. S. M. Jackson took over the records and has maintained them since. He has also undertaken the major task of extracting most of the information from the cards and in this he received some help from Messrs. C. R. Haxby and E. Richards. The final editing, including the addition of the vice-county numbering, was done by Mr. C. I. Rutherford with considerable assistance from Mr. J. H. Flint. Mr. Rutherford also prepared the typescripts for the printers.

THE YORKSHIRE NATURALISTS' UNION ONE HUNDRED AND EIGHTH ANNUAL REPORT

The Hundred and Seventh Annual Meeting was held on 7th December 1968, at Bradford, by invitation of the Bradford Naturalists' Society.

The Presidential Address entitled 'Fossil Birds of Britain and Ireland' was delivered by James Fisher, Esq., M.A., F.L.S., M.B.O.U.

The Presidency for 1970 has been offered to and accepted by J. H. Flint, Esq., F.L.A., F.R.E.S.

The Excursions for 1970 will be to:

V.C. 61	Skipwith	23rd-25th May
V.C. 62	Hutton Rudby	21st June
V.C. 63	Thorne	6th-7th June
V.C. 64	Sherburn for Birkin	4th July
V.C. 65	Askrigg	18th July

Acting on the proposals put forward by last year's President and approved by the Annual Meeting a letter was sent to all affiliated societies, neighbouring County Trusts and Unions and other interested bodies. This affirmed the Union's decision to have regard to the existing vice county boundaries whatever changes might result from future local government boundary changes.

During the year the Executive considered ways of assisting the Ornithological Section in its production of the Annual Report and recently it accepted an invitation from the Dalesman Publishing Co. to contribute the text of a proposed 30,000 word paperback to be called **THE NATURALISTS' YORKSHIRE**. Consideration was also given to supporting organisations protesting about proposals to tip fuel ash on Thorne Waste, a site of scientific interest, particularly for naturalists.

This year's Chislett Memorial Lecture was held in Leeds on 27th September and given by Dr. Franklyn Perring, his subject being 'Recording Britain's Wild Life'. Members of the Executive are currently contributing articles in the Trust's Newsletter; these are attempting in a short space, to describe some of our County's heritage of wild life and are part of the increasing collaboration between the two organisations.

Membership

At the time of writing the membership of the Union comprises one Honorary Life Member, 12 Life Members, 593 Ordinary Members, 53 Associates and 42 Affiliated Societies.

Deaths

We record with regret the death of the following members: Miss J. Grainger, W. R. Grist, Mrs. E. M. Morehouse, M. M. Sayer, Mrs. M. E. Stott, W. O. Steel, S. Sunderland and J. N. Tomlinson.

Resignations

Miss E. Anderson, Mrs. J. N. Arnott, C. G. Booth, Mr. & Mrs. K. L. Butcher, Miss S. E. Fewson, F. Fincher, Miss E. M. Green, W. E. Higham, R. Joice, A. Morrison, C. Scott, A. N. Sykes and Miss F. E. Wood. The Sedgwick Society has resigned, whilst the Bradford Microscopical Society and the Leeds Co-operative Naturalists' Field Club have ceased to exist.

Change of Secretary

The Hornsea Bird Club (Mr. I. Spaul, 'Romany', Mereview Avenue, Hornsea).
Hull Geological Society (Mr. K. Fenton, 17 Mill Walk, Snuff Mill Lane, Cottingham, E. Yorks.).
Hull Scientific & Field Naturalists' Club (Miss A. M. Gowland, 678 Beverley High Road, Hull).
Darlington & Teesdale Naturalists' Field Club (Mr. G. D. Moore, 20 Malvern Crescent, Darlington).
Kirby Moorside & Ryedale Natural History Society (G. Simpson, 37 Whitfield Avenue, Pickering).
Swarthmore Birdwatchers' Club (Miss E. Beevers, 27 Mill Lane, Leeds LS13 3HE).
Wakefield Naturalists' Society (Mrs. K. Roberts, 357 Horbury Road, Wakefield).

Change of Address

- Bird, G., Ventnor House, 25 Westgate, Hornsea.
 Burnham, C. E. A., 'Woodclose', 27 Coach Road, Warton, Carnforth.
 Burton, C. E., 34 Broadway, Barnsley.
 Burton, W. G., Paris House, East Malling, Maidstone, Kent.
 Crossley, R., 2 Mill Rise, Swanland, N. Ferriby, E. Yorks.
 Densley, M., 25 Lawrence Gardens, Leeds 8.
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 Harris, R., The Nook, 74 Bradford Road, Menston, Ilkley.
 Kay, M. S., Valley View, Kirby Overblow, nr. Harrogate.
 Lonsdale, Miss B., 24 Fernbank Drive, Baildon, Shipley.
 Lucas, Mr. and Mrs. B., 8 Cambourne Drive, Fixby, Huddersfield HD2 2NF.
 Lucas, G. V., 22 Wharfedale Crescent, New Lane, Skelmanthorpe.
 Massey, C. I., 4 Chantry Road, E. Ayton, Scarborough.
 Ness, M. H., 73 Cross Lane, Newby, Scarborough.
 Orpin, R., 59 Doncaster Road, Selby.
 Paget, R. J., Glebe Farm House, Harthill, nr. Sheffield.
 Palmer, M. J., 55 Wellington Road, Wilsden, Bingley.
 Rider A. H., c/o Physiotherapy Dept., Sarnia General Hospital, Sarnia, Ontario, Canada.
 Rushforth, D. A., 34 Harecroft Road, Otley.
 Watkinson, L. J., Hallin, 95 Cookridge Lane, Leeds 16.
 Watson, Miss P., 110 Pemberton Road, Haringay, London N.4.
 Williamson, The Rev. Dr. R., M.A., Highfield, Preston Old Road, Cherry Tree, Blackburn BB2 5ND, Lancs.
 Woodward, A. H., The Sheilings, Ripley Road, Knaresborough.
 Yeoman, Miss R., 37 North End, Osmotherley, Northallerton.

New Members

- Abbott, Mrs. P. P., 56 Cookridge Drive, Leeds LS16 7HW (B.O.).
 Aspinall, D. L., M.B., 52 Towthorpe Road, Haxby, York (O).
 Barnes, D., 120 Chalons Road, Dringhouses, York (E).
 Barrow, R. S., B.Sc., North Lodge, Brontë House, Apperley Lane, Apperley Bridge, Bradford (B).
 Barrow, Mrs. Joan S. (A.B.).
 Burton, G., 143 Westbourne Avenue, Hull (O).
 Carr, J., 26 Ashley Road, Wyke, Bradford (Z).
 Clarke, Mrs. E., 16 Elmfield Terrace, York (B.O.).
 Clarke, G., 3 Tedder Road, Acomb, York (O).
 Dugmore, K., 18 Whitethorn Lane, Letchworth, Herts. (O).
 Faulkner, P. A., 22 Fountains Road, Northallerton.
 Foster, R., 11 The Cranbrooks, Wheldrake, York (E).
 Gouldsmith, Mrs. R., Coneysthorpe, York (O.Z.).
 Grant, D. R., B.Sc., 'Highlands', 7 Owlcotes Lane, Pudsey (B).
 Harcourt, R. B., F.R.C.S., 43 Park Square, Leeds 1 (O).
 Harrison, R. L., A.M.A., Museum and Art Gallery Service for Yorkshire and Humber-side, Farnley Hall, Leeds 12.
 Haydon, R. G., 9 Swanland Hill, N. Ferriby, E. Yorks.
 Harrison, Mr. and Mrs. N., 199 Ingrow Lane, Keighley (B.O.).
 Howes, C. A., M.B.O.U., c/o Doncaster Museum, Chequer Road, Doncaster (O.Z.).
 Hydes, P., Crewe Hall, Clarkehouse Road, Sheffield S10 2LL (O).
 Jackson, B., 3 Smithy Lane, Burley-in-Wharfedale, Ilkley (O).
 Lloyd-Evans, L., M.B., CH.B., 22 Bellgreave Avenue, New Mill, Huddersfield HD7 7DP (C.O.).
 Lloyd-Evans, Mrs. M. M. (A).
 Lumley, J. W., 83 Wensley Road, Leeds LS7 2LS (O).
 Middleton, A. L. V., B.V.Sc., M.R.C.V.S., Lund Farm, Lund, Driffield (O.Z.).
 Moore, Mrs. B. A., 36 Newfield Crescent, Dore, Sheffield (O).
 Newth, Miss J. A., 19 Eaton Road, Ilkley.
 O'Toole, M. W., 6 Broom Mount, Leeds LS10 3NL (O).
 Pearson, P., 3 Maple Grove, Fulford Road, York (O).
 Pilling, C. G., 93 Centre Vale, Triangle, Halifax (B.Z.).

Potter, A., Howefield, Baldersby, Thirsk (E).
 Preece, T. F., M.Sc., School of Agricultural Sciences, University, Leeds 2 (M).
 Priestley, G. W., 54 Falcon Road, Bingley (O).
 Priestley, Mrs. M. G. (A).
 Pullan, A. C., Flat 3, 'Longfallas', Knowles Road, Brighouse (E).
 Pyrah, Dr. Enid M., B.Sc., PH.D., Coach House Cottage, Stirton, Skipton (B.O.).
 Pyrah, Dr. Roger D. (A).
 Russell, M. R., 40 Wellclose Terrace, Leeds LS7 1HT (E).
 Sharrock, Miss D. L., 8 Newlands Park Close, Hull Road, York (O).
 Simms, Mrs. J. D., Manor Cottage, Museum Gardens, Museum Street, York.
 Sykes, J. H., 10 Roman Rise, Pontefract (O).
 Thompson, F. J., M.B.O.U., c/o 'Cairn', 1 Stepney Rise, Scarborough (O).
 Vickers, Miss D. E., 14 Osborne Road, Sheffield S11 9AY (B).
 Walpole, H., 68 Outwoods Road, Loughborough, Leics.
 Ward, J., Greenhill Nurseries, Hill End Road, Armley, Leeds 12 (O).
 Wardman, F. A., 8 Sedbergh Park, Ilkley (O).

MAMMALS, REPTILES AND AMPHIBIANS

C. SIMMS

Reports on Fishes, and also Cetacea, are being held over until 1970. Space also forbids some of the more interesting records being reported here in more than brief outline. This Report was compiled in November 1969 and includes some matters unresolved at the time of compilation of the 1968 Report as well as some 1968 and earlier material received since then.

There has been an encouraging increase in the numbers of contributors and in the area cover represented, but V.C. 65 is still so under-worked that it is hardly involved in these notes. Mesdames S. A. Bell (Cleveland), G. de Boer (Hull), J. Robertson (York), C. M. Simpson (Selby), and M. Taylor (Driffield); Messrs. J. S. Armitage (Barnsley), P. Balch (York), N. Cowx (Malton), C. Dale (Cleveland), D. Herringshaw (Sheffield), C. I. Massey (Scarborough), J. Miller (York), J. H. Rushton (Driffield), W. Sanderson (Keighley), C. Simms (York and elsewhere), C. A. Street (Flaxton), M. J. A. Thompson (York and elsewhere) and A. J. Wallis (Scarborough) were the main contributors, and there were composite reports from Natural History Societies at Harrogate, Hull and York. Messrs. Armitage, Herringshaw and Thompson provided critical notes from several other observers and the following others have helped considerably in the field (apart from at Union field meetings); Mesdames J. G. Lambert, I. Lester and H. Moore; Messrs. B. Gallagher, P. Walls and J. Woodcock. Four visitors to the county provided valuable notes; Miss E. Hurrell and Messrs. M. Buckler, R. H. Clark and W. G. Teagle. The setting-up of loosely-organised groups to tackle particular field problems has proved productive and is to be further encouraged, particularly for small mammal live-trapping and for the investigation of fresh-water fishes and bat distributions. Mr. Herringshaw has sent very valuable notes from the Sheffield region for 1967-8; any other past records unpublished elsewhere would help fill what is still, of course, a very patchy picture of vertebrate distributions in the county. A few unconfirmed or unresolved reports are held over until settled. Your recorder thanks all contributors for their patience and hard work.

County distribution-maps for a few species are on display at the Yorkshire Museum, York and these provide more stimulus for further work than adequate statements of distribution (except of reporters!). It is hoped to use these at future Sectional Meetings and to advertise the work of the Union. Publications in other journals during the year to date and referring to our region are few; details from the Secretary, who has copies of a V.C. 62 pond herpetofauna study available. Dr. Thompson is preparing a parish Natural History of Skelton, near York.

MAMMALIA

Carnivores continue to receive the most consistent attention; there is a particular shortage of small-mammal trapping, which would often yield useful results very quickly.

INSECTIVORES

J.S.A. remarks on how only some stretches of road seem to show Hedgehog casualties. C.I.M.'s survey of these casualties in his district continues. There are

valuable notes on these and other insectivores in Craven from Mr. Teagle and records from the Malton area (N.C.), but few otherwise.

There are 'new' localities for all three shrews in the Scarborough district (C.I.M.). This must be the best-worked part of the county for small mammals.

BATS

The most exciting record is the re-discovery of Natterer's Bat at Sherburn Ings (per C.I.M.); the species has not been reported from the Scarborough district for over sixty years. Another valuable re-discovery was that of the Common Long-eared Bat in Sheffield on April 1st (D.H.); apparently the first since 1913. A Daubenton's Bat was caught in a mist net at South Cave (Mrs. de B.) and Noctule, Pipistrelle and Common Long-eared Bat have been examined at the Yorkshire Museum from the Camblesforth and Selby district.

CARNIVORES

A metacarpal and a few teeth of recent Brown Bear have been recovered from a stream bed in Upper Swaledale (Yorkshire Museum 1969z68). Pine Martens have been located in S.W. Yorkshire after the skin of a freshly-shot individual was received at the Yorkshire Museum in April (1969z49). Fieldwork is proceeding. This is the first definite county record of an individual not considered to be an 'escape' for over twenty years but similar 'sign' has been seen in another part of the county (C.S.) and more widespread familiarity with it could lead to further reports. Here, as elsewhere, we need mobile and patient field parties to investigate reports quickly and on the spot. There are encouragingly-increased reports of Ermine (Stoats); especially from V.C. 61 (Hull Naturalists) and the Scarborough district (C.I.M.). Weasels, by comparison, seem to have been seen less this year and none have been received at the Yorkshire Museum. Both these smaller mustelids and the Badger seem to be reported mainly as road casualties.

Please send reports of Badger setts direct to the appropriate Badger Survey Vice-County Recorder, although I will forward these if necessary.

The feral American Mink has not been found in some of its 1967-8 localities, but still breeds near Elland and probably elsewhere in the West Riding where it is now widespread. There are recent reports from near Ripon, Harrogate, along the upper Aire and the lower Wharfe and Nidd, and several unconfirmed reports from further north in V.C's 64 and 65. In the north-east it has been found near Whitby but has not been reported from the Ouse and Sherrif Hutton districts.

Less work has been done on Otter distribution this year except in the Ripon area and no useful summary can be offered although there have been encouraging reports from the north-west and Otters have probably bred in two places along the Cleveland Esk.

PINNIPEDS

Records of Grey Seals are mainly of winter occurrences off the coast, but there are very few reports of Common Seal anywhere. C.I.M. and C.S. have been unable to investigate their status as hoped; a coastal seal working-party might find Otters as well.

ARTIODACTYLS

If Red and Roe Deer continue their evident spread we shall soon have them in the flesh in some of those places where archaeologists are currently turning up their bones. There is welcome and growing interest in these large and mobile but elusive animals, but field recognition-points are still not well-known. There have been further reports of Roe in the Howardian tract and elsewhere in V.C. 62 adjacent to known woods and as far into the Vale of York as near Skelton (M.J.A.T.) and Huby (C.S.). Red Deer, as well as Roe, have been seen along the Hambleton escarpment, and Sika at Denby Dale (various observers). The status of Deer in V.C. 65 is still very little known to us.

LAGOMORPHS

Apart from A.J.W., few report regularly on Common Hares. Rabbits are to be seen in larger numbers in most parts of the county, including a few suburban areas and also Scarborough Castle Hill (A.J.W.). The most useful lagomorph records are from a visiting Dorset naturalist, and refer to the Craven district.

RODENTS

Burton Constable (per Mrs. de B.) is another Red Squirrel locality for V.C. 61, but clearly the south-west and north-west of the county are this species' main Yorkshire strongholds. I have been very impressed by their numbers about Bretton. The Grey Squirrel is apparently less common—or at least less frequently seen—throughout the county. Mice and Voles do not feature much in reports this year, partly reflecting the lack of trapping. Owl pellet records are useful, but we can rarely be sure where the owl picks up its prey.

The Water Vole needs students in Yorkshire; its distribution tends to be much assumed and little known; few of our museums have representative series of skins and such an easily observed animal is, apparently, little noticed.

REPTILIA

Parts of the southern and north-eastern vice-counties are now regularly and relatively well worked, but vice-counties 64 and 65 are very poorly known by Union members. The central Vale presents latitudinal strings of records of the three commoner species Slow Worm, Common Lizard and Viper which seem related to physical and land-use features, amongst which the frequency of flooding seems to be of some importance; but what of the distribution of reptiles in the new forests or amongst the spoil-heaps?

LIZARDS

A small gecko from Raincliffe Woods near Scarborough, 25th October 1968 (C.I.M.) proved to be an immature Moorish Gecko (*Tarentola mauritanica*) (L) (det. E. N. Arnold) but no other aliens have been reported this year, although Mr. Massey tells me the feral 'Wall' Lizards at Scarborough are still surviving. Whether they breed is another matter, and the possible origin of the Gecko problematical! The indigenous species have had a good year in the districts most studied. The Slow Worm has been found at Stape, near Hackness, Ellerburn N.R., Scalby cliffs and Goathland (C.I.M.); in Northdale, Bransdale, Coverdale, Snotterdale and near York at Linton and Stillington (C.S.). Rather disappointingly, there are no new localities for Common Lizard reported this year, and there are few reports outside V.C. 62. A little unsuccessful work has been done on the reports of Sand Lizard from Spurn and Teesmouth.

SNAKES

Another very good year in the field, with three 'new' V.C. 61 localities for Grass Snakes at Driffild (J.H.R. and Miss M.T.), Nunburnholme and near Acklam (C.S.). In V.C. 63 'new' records include near Sheffield (D.H.) and near Goole and Thorne (thanks to information from local naturalists). These must be set against many disappointments in the same vice-county, however. The Tessellated Snake is now known from Cleveland (C.D.) and there has been a further record from near Goole (Yorkshire Museum 1969Z40a). So far there are no definite indications of this species breeding in the wild.

The Viper is widely reported, but the few 'new' localities are all in the Hatfield-Goole district except one near Malton (C.S.). On the North York Moors the viviparous hatching of the young was very early (M.B. and C.S.) but this did not seem to be the case elsewhere and was certainly not so at Strensall Common. The status of snakes at Skipwith Common and at Bishop Wood needs clarifying. As with many 'other vertebrates' this recorder declines to give precise locations except to *bona fide* students and for the Biological Records Centre; there seems to be collecting pressure on the Grass Snake at least.

The practice of reporting occurrences supported by colour slides is growing and is welcome; these can usually be returned very quickly.

AMPHIBIA

Records of amphibia on the Wolds are at last beginning to trickle in, but reports of all species are very much needed. Perhaps the paucity of amphibians in that increasingly prairie-farmed and dry region is more apparent than real.

NEWT

The Crested Newt, considered by several observers to be declining, is reported from Driffild (various observers), Flaxton (C.A.S.), and Silpho (C.I.M.); but not in

otherwise comprehensive notes from the Sheffield district, where the Palmate Newt, by contrast, is evidently widespread (D.H.). This mainly upland species is reported from several more Scarborough district ponds (C.I.M.). The Common Newt is reported from Hunmanby, Ellerburn (C.I.M.), Pickering, Guisborough, Scugdale and Thirsk (C.S.).

TOADS

Another good crop of Common Toad records from the Scarborough district includes Jugger Howe Beck Moors, Staxton, Silpho (C.I.M.) and the results of two seasons' observation by A.J.W. of casualties on the road beside Throxenby Mere. The York district is also well reported, with information of 'new' breeding-ponds at Flaxton (C.A.S.) and elsewhere. These observers have supplied grid references to known breeding-ponds of amphibians; these avoid much geographical description or vagueness and are very convenient for both your county recorder and national records. The status of the Natterjack Toad in Yorkshire is still uncertain today. Dr. E. W. Taylor has supplied information on the 'old' localities.

FROGS

Again there is useful information on status only from the Scarborough and York districts. The general impression is that the Common Frog is still locally abundant but apparently less widespread than in some past seasons when a wider view is taken. Careful long-term studies are needed from a variety of places, but all of us could note and bring to general notice proposals to fill or drain traditional breeding-ponds. When this happens, and it happens quite often, what do the amphibians do in the succeeding seasons?

ORNITHOLOGY

(F. J. Roberts): 1969 saw the continuation of the practice of holding one of the year's meetings of the Joint Vertebrates Sections outside Leeds. This year the March meeting was at Scarborough, at the invitation of the Scarborough Field Naturalists' Society, on 22nd March. As if by invitation also, a Red-necked Grebe and a Slavonian Grebe swam together in Scarborough harbour during the day and gave many members excellent views.

The autumn meeting, in Leeds as usual, was on 18th October.

In the Interim Ornithological Reports, A. J. Wallis referred to the Nutcracker invasion of autumn 1968, with a minimum of nine in the county. Two had overwintered near Scarborough, the last being seen on 4th May 1969. The spring arrival of migrants had been about normal with the notable exception of the Whitethroat, numbers of which had crashed nationally to about a tenth of normal. The breeding season had otherwise been a good one for most species. Interesting features of the autumn passage were good numbers of Shearwaters and Skuas and unprecedented numbers of Curlew Sandpipers, including 230 at Teesmouth.

J. K. Fenton and B. S. Pashby gave two reports on Spurn Bird Observatory. 1969 had been overall a quiet year — the fine settled autumn in particular producing few movements of note — though with some features of interest. If 1968 was for Spurn a 'warbler year' then 1969 must be a 'bird-of-prey year'. On one memorable day, 18th September, seven species of raptor were recorded, and four days later 98 Kestrels passed down the peninsular. Ringing totals were down on last year and one of the few 'rushes' occurred just after the Ringers' Conference held at Spurn in September. One of the more notable species of the autumn was Spotted Crake, actually the first for Spurn this century.

C. H. Wilson, Hon. Secretary of the Protection of Birds Act Committee, reported that his Committee had distributed during the year 3,200 posters on bird protection to schools and other interested bodies: 3,500 were to be sent out before the next nesting season. He was also able to report that, after many years of negotiation, the R.S.P.B. is to set up a reserve on part of Bempton Cliffs (although a major landowner has withdrawn his support after irresponsible behaviour from a group of bird-watchers).

The recent use in the county of pole-traps and the laying as bait of eggs poisoned with strychnine were mentioned and Mr. Wilson asked that any information on these illegal practices be passed on to him.

After the business of the October meeting, three members of the Section gave short talks on their experiences with recent bird rarities, a new and interesting and

often amusing feature in our meetings. Towards the end of the year, a meeting is to be arranged between representatives of the Birds and F.A.R.M. Sections with a view to streamlining the business side of the meetings, so that many more features and variety may be introduced into the agenda. It has become obvious in recent meetings that these days the average birder values his Saturday 'in the field' to the exclusion of loyalty to his Union; our aim must be to lure him indoors with a programme as exciting as whatever he may be missing by sewage-farm or shore.

The combined 1965-6 Ornithological Report was published early in the year and was on sale at the meeting. The 1967 and '68 Reports, which will also appear together in a double report are still delayed at the time of writing but should appear soon.

An outing by boat to the Bempton and Flamborough Cliffs in June was arranged with the R.S.P.B. and many members availed themselves of the opportunity to see the bird-life there from a less usual angle.

CONCHOLOGY

(E. Dearing): The section has held four indoor meetings in the Leeds City Museum, by kind permission of the Director, and four field excursions. Attendance at the meetings has been most encouraging.

Mr. A. Norris spoke on 'Yorkshire Marine Mollusca' at the January meeting. Dr. L. Lloyd-Evans discussed 'Gasteropod Anatomy' and illustrated his talk with dissections of slugs to show the diagnostic features in February. Members retired into the corridor to achieve darkness and see the slides shown by Dr. B. Colville to amplify his descriptions of 'Holiday Collecting on the Continent' in March. The Annual Meeting took place in October and Mr. J. Armitage showed an extensive series of Clausilias whilst explaining something of their distribution and differences.

Mr. A. Norris, the Recorder, draws attention to the importance of the finding of *Vertigo pusilla* Müller by Dr. Lloyd-Evans at the base of a ruined wall at Jervaulx Abbey. It is the first authentic record for V.C. 65; although it was reported previously from West Tanfield, on the border between V.C. 64 and V.C. 65, the exact locality is unknown. At Lastingham another interesting find was that of *Cecilioides acicula* (Müller) under a stone near Cropton. This is an unusual habitat for the subterranean species. *Limax cinereoniger* Wolf was common in woodland between Cropton and Appleton-le-Moors. A local species in Yorkshire this slug seems to occur fairly commonly in woods from Cropton to Thornton Dale and then sparsely along the southern edge of Fylingdales Moor through to Forge Valley.

RECORDS FOR SECTIONAL EXCURSIONS, 1969, COLLATED BY A. NORRIS

Localities: (1) Lythe Wood, Grassington (64), 12/4/69; (2) Green Hammerton and Cattall (64), 10/5/69; (3) Escrick, Wheldrake and Thorganby (61), 13/9/69; (4) Bishop Wood, Bishop Dike and Cawood (64), 13/9/69; (5) Thornhill, Coxley Valley, Midgeley and Bretton Park (63), 11/10/69.

Nomenclature is according to the *Census of the Distribution of British Non-Marine Mollusca*, 1951.

Valvata cristata Müller, 5
V. piscinalis (Müller), 3, 4
Pomatias elegans (Müller), 1
Potamopyrgus jenkinsi (Smith), 2, 3, 4, 5
Bithynia tentaculata (L.), 4
Carychium minimum Müller, 1, 2, 3, 4, 5
C. tridentatum (Risso), 1, 2, 3, 4, 5
Lymnaea truncatula (Müller), 1, 3, 5
L. glabra (Müller), 4
L. palustris (Müller), 3
L. stagnalis (L.), 5
L. peregra (Müller), 1, 2, 3, 4, 5
Aplexa hypnorum (L.), 3
Physa fontinalis (L.), 4, 5
Planorbis planorbis (L.), 5

P. vortex (L.), 5
P. leucostoma Millet, 3, 5
P. albus Müller, 2, 5
P. crista (L.), 2, 5
P. contortus (L.), 5
Segmentina complanata (L.), 5
Acroloxus lacustris (L.), 1
Ancylus fluviatilis Müller, 1, 2
Succinea putris (L.), 2, 3, 5
S. pfeifferi Rossmässler, 1
Azeca goodalli (Férussac), 5
Cochlicopa lubrica (Müller), 1, 2, 3, 4, 5
C. lubricella (Stabile), 1, 2, 3, 4
Pyramidula rupestris (Draparnaud), 1
Columella edentula (Draparnaud), 4

- Vertigo antiverigo* (Draparnaud), 1
V. substriata (Jeffreys), 1
V. pygmaea (Draparnaud), 1
Lauria cylindracea (da Costa), 1, 4
Vallonia costata (Müller), 2, 3, 4
V. excentrica Sterki, 1, 2, 3, 4, 5
Ena obscura (Müller), 1, 2
Marpessa laminata (Montagu), 1
Clausilia bidentata (Ström), 1, 5
C. dubia Draparnaud, 1
Balea perversa (L.), 1
Helicigona lapicida (L.), 1
Arianta arbustorum (L.), 1, 2, 3, 4
Helix hortensis Müller, 1, 2
H. nemoralis L., 1, 2, 3, 4, 5
H. aspersa Müller, 2, 3, 4
Hygromia striolata (C. Pfeiffer), 1, 2, 3, 4, 5
H. hispida (L.), 1, 2, 3, 4, 5
Monacha granulata (Alder), 1
M. cantiana (Montagu), 2, 3, 4
Helicella caeperata (Montagu), 3
H. itala (L.), 1
Punctum pygmaeum (Draparnaud), 1, 2, 5
Discus rotundatus (Müller), 1, 2, 3, 4, 5
Arion intermedius Normand, 1, 2, 3, 4, 5
A. circumscriptus Johnston, 1, 2, 3, 4, 5
A. hortensis Férussac, 1, 2, 3, 4, 5
A. subfuscus (Draparnaud), 1, 2, 3
A. ater (L.) agg., 1, 2, 3, 4, 5
Euconulus fulvus (Müller), 1, 2, 3, 4, 5
Vitrea crystallina (Müller), 1, 2, 3, 5
V. contracta (Westerlund), 1, 2, 5
Oxychilus cellarius (Müller), 1, 2, 3, 4, 5
O. alliarius (Miller), 1, 2, 3, 4, 5
O. helveticus (Blum), 1, 4
Retinella radiatula (Alder), 1, 3, 4, 5
R. pura (Alder), 1, 2, 5
R. nitidula (Draparnaud), 1, 2, 3, 4, 5
Zonitoides excavatus (Alder), 5
Z. nitidus (Müller), 1, 3
Vitrina pellucida (Müller), 1, 2, 3, 4, 5
Milax budapestensis (Hazay), 2, 3, 4, 5
Limax maximus L., 1, 2, 3, 5
Lehmannia marginatus Müller, 1
Agriolimax reticulatus (Müller), 1, 2, 3, 4, 5
A. laevis (Müller), 1, 2, 3, 4, 5
Unio pictorum (L.), 2
Anodonta anatina (L.), 2
A. cygnea (L.), 5
A. minima Millet, 2
Sphaerium corneum (L.), 3, 4, 5
S. lacustre (Müller), 5
Pisidium casertanum (Poli), 1
P. personatum Malm, 1, 2

ENTOMOLOGY

Coleoptera (E. W. Aubrook): Individuals of many species of Coleoptera have been observed in large numbers in various parts of the county and may have resulted from the excellent weather which characterised the summer and autumn of 1969. The glow-worm *Lampyris noctiluca* jewelled the Reserve at Ellerburn Bank in June and was also observed in the Langdale Valley. The fen beetle, *Agonum livens*, was abundant at Edderthorpe Ings under similar conditions to its original Yorkshire locality at Denaby Ings. *Agabus undulatus* was found plentifully in a small pond at Dringhouses and an odd specimen in the nearby brick-pit; it is hoped that this species, formerly one of the Askham Bog specialities, may be able to survive in the area. A considerable proportion of the new records comes from the Doncaster area and provides further proof of the potential of this part of Yorkshire.

I am grateful for records to Mr. D. Barnes, Mrs. H. E. Flint, Mr. J. D. H. Flint, Mr. J. H. Flint, Mr. F. Hawkins, Rev. E. J. Pearce, Mr. P. Skidmore and Mr. D. E. Whittaker.

In the following list seven species are new to the county and 25 are new vice-county records.

Agonum livens (Gyll.) (63) Edderthorpe Ings, 4/69; P.S.

**Halipilus heydeni* Wehn. (64) Askham Bog, 9/4/69; E.J.P.

Hydroporus incognitus Shp. (63) Potteric Carr, 17/5/69; J.D.H.F.

**Agabus unguicularis* Thoms. (63) Potteric Carr, 17/5/69; J.D.H.F.

**Dytiscus dimidiatus* Berg. (63) Thorne, 1965; N. Bunting.

Hydraena testacea Curt. (63) Torne Bridge, 25/6/69; E.W.A. The first Yorkshire record for many years.

**Limnebius nitidus* (Marsh.) (63) Torne Bridge, 25/6/69; E.W.A.

†*Cryptopleurum subtile* Shp. (64) Low Dunsforth, in vegetable refuse, 25/9/68; E.W.A. Recently added to the British list.

†*Orthoperus atomus* (Gyll.) (64) Healaugh, bred from old ivy, March 1968; J.H.F.

Pseudopsis sulcata Newm. (64) Walshford Bridge, very common in manure heap, 26/7/69; E.W.A.

Proteinus macropterus (Gyll.) (63) Stockmoor Reserve, 11/6/69; E.W.A. The third Yorkshire record.

**Acrolocha sulcula* (Steph.) (63) Thurstonland, several in horse dung, 5/10/69; E.W.A.

- **Phyllodrepa ioptera* (Steph.) (65) High Force, 20/9/65; E.W.A.
Deliphrum tectum (Payk.) (63) Thurstonland, in horse dung, 5/10/69; E.W.A.
 **Aploderus caelatus* (Grav.) (64) Queen Mary's Dub, 4/9/68; E.W.A.
 **Myllaena elongata* (Matth.) (63) Bretton Park, 25/6/48; E.W.A.
 †*Myllaena infusata* Kr. (†63) West Bretton, 2/2/49; E.W.A.: (*64) Askham Bog, 3/4/65; E.W.A.
 **Gyrophæna nana* (Payk.) (63) Torne Bridge, 25/9/69; E.W.A.
 **Gyrophæna bihamata* Thoms. (63) Torne Bridge, 25/9/69; E.W.A.
 **Atheta insecta* (Thoms.) (62) Fen Bog, 9/8/69; E.W.A.
 †*Atheta subtilis* (Schr.) (64) Askham Bog, 14/5/69; E.W.A.
 **Atheta laevana* (Muls.) (62) Fen Bog, 9/8/69; E.W.A.
 **Atheta clientula* (Er.) (64) Walshford Bridge, 25/7/69; E.W.A.
 **Atheta subsinuata* (Er.) (*62) Pickering, 20/9/69; E.W.A.: (*63) Birstall, 16/8/69; E.W.A.
Microlophus flavicornis (Hbst.) (63) Stockmoor Reserve, 8/69; F.H.
Lambyris noctiluca (L.) (62) Ellerburn Bank Reserve, 19/6/69; D. E. Whittaker.
 **Hylecoetus dermestoides* (L.) (61) Skipwith Common, 6/69; J.H.F.
 **Trixagus carinifrons* (Bonv.) (63) Haw Park, Wakefield, 22/7/65; E.W.A. The second Yorkshire record.
Dermestes frischii Kug. (63) Batley, 10/67; M. Clegg.
Anthrenus fuscus Ol. (63) Ellerholme Farm, Hatfield, 23/7/69; E.W.A.
 **Monotoma spinicollis* Aub. (64) Queen Mary's Dub, 4/9/68; E.W.A. The second Yorkshire record.
 †*Cryptolestes* (*Laemophloeus*) *capensis* Waltl. (63) Storthes Hall, Huddersfield, introduced in pearl barley, 2/63; E.W.A.
 **Atomaria nigriventris* Steph. (63) Stockmoor Reserve, 22/5/65; E.W.A.
Corticaria umbilicata (Beck.) (62) Fen Bog, in *Deschampsia* litter, 9/8/69; E.W.A.
 †*Corticaria linearis* (Payk.) (62) Dalby Forest, between fresh cut pine poles, 28/6/69; E.W.A.
 **Cis festivus* Panz. (65) High Force, 20/9/65; E.W.A.
 †*Bruchidius ater* (Marsh.) (63) Blaxton Common, 25/6/69; E.W.A.
 **Apion tenue* Kirb. (64) Burton Leonard, 26/7/67; E.W.A.
 **Omius mollinus* Boh. (63) Thorne Moors, 4/6/69; P.S.
 **Barypeithes sulcifrons* (Boh.) (63) Lindholme Airfield, 15/6/69; E.W.A.
 **Sitona lineelus* (Bons.) (61) Bridlington, 18/4/65; E.W.A.: (*62) Gundale, in plenty on *Lotus corniculatus*, 19/7/65; E.W.A.
Ceuthorrhynchus asperifoliarum (Gyll.) (63) Lindholme, 15/6/69; E.W.A.
Eubrychius velatus (Beck.) (63) Torne Bridge, 25/6/69; E.W.A.

Hemiptera (J. H. Flint): Various preoccupations have restricted the amount of field work done by members during the past season and this report is accordingly shorter than usual. The most noteworthy discovery is that of *Stenodema trispinosum* Reut. which was not known previously north of Norfolk and Cambridgeshire, but several of the other records indicate the strong southern element in the insect fauna of the East Riding and we may expect more additions to the county list from this area. *Nezara viridula* L. is, of course, an accidental importation but although it is unlikely that it could establish itself its occurrence should be recorded.

Records have been received from Messrs. D. Barnes, H. E. Beaumont, R. Crossley, Jeremy D. H. Flint and P. Skidmore to whom I express my thanks. Their initials are used in the list of species below.

HETEROPTERA

- Sehirus bicolor* (L.) (63) Adwick-le-Street. First reported in the county from this locality in 1968 by H.E.B., nymphs have been taken on *Lamium album* in June, July and August this year and adults on 7/6/69 and 10/8/69; H.E.B. Evidently well established.
 †*Nezara viridula* (L.) (63) Tickhill, an example of this cosmopolitan insect, an importation on vegetables, found in a house, 2/69; H.E.B. (teste P. Skidmore).
Dictyonota strichnocera Fieb. (61) Skipwith Common, on *Ulex europaeus*, 7/9/69; R.C. The only previous records are from Allerthorpe and Escrick.
Dolichonabis lineatus (Dahl.) (61) Brough, on salt marsh, 30/8/69; R.C.

- Anthocoris limbatus* Fieb. (63) Thorne Waste, on sallow (*Salix* sp.), 6/7/69; R.C. The second Yorkshire record of this fenland bug.
- **Hoplomachus thunbergi* (Fall.) (63) Low Ellers Reserve, Potteric Carr, 5/7/69; P.S.
- **Orthotylus ericetorum* (Fall.) (61) Skipwith Common, 7/9/69; J.H.F. A common bug on heather.
- **Camptozygum pinastri* (Fall.) (64) Acomb Wood, York, 2/10/69; D.B.
- Adelphocoris lineolatus* (Goeze) (61) North Ferriby, on *Ononis repens*, 1/9/69; R.C.
- Megacelum infusum* (H.-S.) (64) Acomb Wood, 2/10/68; D.B.
- Capsus wagneri* Rem. (61) Melbourne, 13/7/69, another male in the same locality as that reported last year; R.C. It was taken on *Phalaris arundinacea* (det. Miss F. E. Crackles); *Calamagrostis* spp., believed to be the food plant, is not known in the area.
- †*Stenodema trispinosum* Reut. (61) North Ferriby, grasses by the side of the Humber, 19/7/69; R.C.
- Megaloceraea recticornis* (Geoff.) (61) North Ferriby, 1/9/69; R.C.
- Notonecta marmorea* s. *viridis* Delc. (61) Cherry Cob Sands, near Keyingham, in brackish water, 14/7/69; J.D.H.F. Only known previously north of the Wash at Kilnsea.
- Micronecta poweri* (D. and S.) (64) Sicklinghall, village pond, 7/68; Ribbleshead, stream near Ling Gill, 5/7/69; J.D.H.F.

HOMOPTERA

- Kybos betulicola* Wag. (61) Skipwith Common, 7/9/69; Strensall Common, 22/9/69; J.H.F. Probably common in most places on birch (*Betula verrucosa*).

Diptera (P. Skidmore): While the number of records this year is far less than last year, several valuable additions are included again. It would be incorrect to say it had been a poor year for Diptera, rather was it a poor one for Dipterists in that pressures of other work had to take priority with those who normally supply the bulk of the records of flies. During 1969 the writer was deeply committed in botanical survey work and studies of the literature concerning Thorne Waste, a site long held in regard by many Yorkshire naturalists but one about which virtually nothing is known concerning its entomological fauna. It was necessary for conservation reasons to establish beyond doubt the natural history importance of this site at the present time. That it had once been a unique place for botanists is well known but it had long been felt that the interest no longer remained there. A survey team was set up and it was possible to establish beyond doubt that it remains a unique site. It is hoped that in forthcoming years a much more intensive survey of the whole 6,000 acres which makes up the 'Wastes' of Thorne and the contiguous moors will be carried out by the various sections of the Y.N.U. Except where otherwise stated all records are V.C. 63.

- **Tipula melanoceros* Schumm. Thorne Moors, August–October 1969, very abundant; P.S. A typical peat bog crane fly.
- **T. nigra* L. Little Smeaton, 14/6/69; P.S. This is a very local species only known in Yorkshire from a few sites near York.
- **Ptychoptera minuta* (Tonnoir) Thorne Moors, numerous along old canal cut in 1870's. July–August 1969; P.S.
- **Leptempis grisea* (Fallen) Thorne Moors, 6/7/69, several in *Salix* carr; P.S.
- †*Stilpon sublnatum* Collin Thorne Moors, 24/4/69, one male sieved from *Molinia* litter on wet peat; P.S. A characteristic but very little-known peat bog species.
- **Poecilobothrus nobilitatus* (L.) Snaith, in abundance in *Glyceria* marsh by river, 7/69; P.S.
- **Hydrophorus albiceps* Frey Thorne Moors, August–October 1969, common over much of area in peat cuttings, even the most recent; P.S. A boreal species found from the Craven pennines northwards.
- †*Eumerus strigatus* (Fallen) (62) Strensall Common, 9/6/68; J.H.F. It is remarkable that this appears to be new to the county. It occurs on the Lincolnshire side of the Hatfield Chase area (Hurst Priory etc.).
- †*Rhacochlaena toxoneura* (Lw.) Denaby Ings, singly on 29/5/68 and 25/6/69, by sweeping beneath old *Salix fragilis*; P.S. A very little-known species said to be associated with old willows in southern England.
- †*Psila gracilis* Mg. Thorne Moors, 12/7/69, in numbers in carrland; P.S.
- †*Trepidaria ephippium* (F.) Thorne Moors, several on 16/8/69; P.S.

- **Knutsonia (Ilione) lineata* (Fallen) Thorne Moors, several by sweeping along old peat canal, 6/7/69; R.C., P.S.
- **Limnia paludicola* Elberg. Thorne Moors, several noted, 16/8/69; P.S.
- **Oecothea fenestralis* (Fallen) (61) Spurn Bird Observatory, one at light, 9/69; B. Spence.
- †*Ochthera mantis* (L.) Thorne Moors, widespread but most numerous along the old peat canals; first noted on 16/8/69 on Lincolnshire border but also later on western side of moors (latest 8/10); P.S. The discovery of this 'Mantis fly' was to be expected on Thorne Moors although it is always a very local insect; it is a characteristic inhabitant of very old peat bogs and is found from Hampshire northwards to Sutherland. It is known from Nottinghamshire and Cheshire but there appears to be no previous Yorkshire record.
- **Drosophila transversa* Fallen Low Ellers Nature Reserve (Potteric Carr), 21/8/68; P.S.
- †*Calamoncosis laminiformis* Beck Denaby Ings, 11/5/68; abundant amongst *Glyceria aquatica*, noted also in 1969 in great quantity; P.S. Collin (1946: *Trans. R. ent. Soc. Lond.* 97; 120-1) states that this fly breeds in the inflorescences of *G. aquatica*.
- †*Melanagromyza lappae* Lw. Denaby Ings, reared from pupae found in stems of *Heracleum sphondylium* on 12/4/69, emerged 28/5; P.S.
- **Pogonota hircus* Zett. Thorne Moors, 12/7/69 and 16/8/69; P.S. A most remarkable discovery for this is an arctic-highboreal fly only known in Yorkshire from the Malham area. Its occurrence on so low lying a site so far south (in Britain it is mainly a Scottish insect) is most surprising. Two colonies were found on Thorne Moors about two miles apart.
- **Cordilura pudica* Mg. Thorne Moors, 6/7/69; P.S. The occurrence of this peat bog species on Thorne Moors was expected as it is also on Skipwith Common.
- †*Macquartia grisea* (Fallen) Thorne Moors, 16/8/69; P.S. This is parasitic on *Chrysomela fastuosa* L., a common leaf beetle on the moor edges and old warplands.
- †*Tachina larvarum* (L.) Thorne Moors, 16/9/69, numerous; P.S. That this very common Tachinid was not on the Yorkshire list seems incredible.
- **Protocalliphora sordida* Zett. 61) Spurn Bird Observatory, 9/69, male at light; B. Spence.
- †*Phytobia (Dizygomyza) iraeos* Gour. Inkle Moor (Thorne Moor edges), larval mines in *Iris pseudacorus*; 23/10/69; C. J. Devlin.
- **Phytomyza periclymeni* Meij. Sandall Beat Wood (Doncaster), larval mines in *Lonicera*; 25/10/69; P.S.
- **P. anthrisci* Hendel. Sandall Beat; 25/10/69; Thorne Moor edges; 28/10/69; larval mines in *Anthriscus*; P.S.
- **Agromyza anthracina* Mg. Thorne Moor edges; 28/10/69; Sandall Beat; 30/10/69; larval mines in *Urtica dioica*; P.S.
- **A. reptans* Fallen Thorne Moor edges; 28/10/69; in *Urtica dioica* leaves; P.S.
- **A. spiraeae* Kltb. Sandall Beat; 30/10/69; larval mines in *Rubus idaeus*; P.S.
- **Prosaltia sylvestris* Fallen Thorne Moor; 25/5/67; P.S.
- **Pegomya praepotens* Wd. Sandall Beat; 5/8/68; P.S.
- †*P. intermedia* Mg. Sandall Beat; 31/7/65; P.S. (det. E.C.M.d'A. Fonseca).
- **Hylephila personata* Collin Gunthwaite; 3/6/66; Auckley; 24/5/67; Little Smeaton; 30/5/67; P.S.
- **Acroptena ambigua* Fallen Blaxton Common; 11/6/68; P.S.
- †*Pegohylemyia cinerea* Fallen Honley Wood; 26/5/61; P.S. (det. E.C.M.d'A. Fonseca).
- **Leptohylemyia coarctata* Fallen Fox Covert near Barnby Dun; 4/7/65; P.S. (det. E.C.M.d'A. Fonseca).
- **Pegomya femorata* Stein. Slackcotes Valley (near Delph), 22/5/63; P.S. (det. E.C.M.d'A. Fonseca).
- †*P. flavipes* Fallen Edlington Wood, 22/7/65; P.S. (det. E.C.M.d'A. Fonseca).
- **P. setaria* Mg. Sandall Beat; 1/6/66; P.S. (det. E.C.M.d'A. Fonseca).
- **Delia cilicrura* Rondani Hooton Roberts, 29/8/65; C. J. Devlin.

Lepidoptera (S. M. Jackson): 1969 has been the best year for butterflies for a long time, some species having made a remarkable recovery. It is hoped that some of the fritillaries like *A. selene*, of which records in recent years have been rather sparse,

will also recover. During 1969 the migrant species were much in evidence particularly the more familiar ones like Red Admiral and Silver Y. One definite addition to the county list was made during 1969—the Oblique Striped moth (*Mesotype virgata* (Huf)).

Each year fewer collectors are sending in their reports but thanks are offered to the following for their records:—Messrs. W. E. Collinson, T. Ford, J. H. Flint, C. R. Haxby, A. M. R. Herton, J. D. Pickup, P. Skidmore, S. L. Sutton, P. Tannett and P. Winter.

Gonepteryx rhamni (L.) (Brimstone) (64) Hetchell Wood Reserve, 25/5/69; J. Gilleggan. (This has been common in the Lake District and may well be extending range again.)

Argynnis euphrosyne (L.) (Pearl-bordered Fritillary) (62) Raindale, 10/6/69; P.W.

A. aglaia (L.) (Dark Green Fritillary) (62) Ellerburn Bank, common on 23/7/69; (64) Scarcroft, 14/8/69.

A. urticae (L.) (Small Tortoiseshell) Much commoner than usual, larvae seen in late August produced late second brood in September–October.

Nymphalis io (L.) (Peacock) Again a remarkably good year, the species having been noted, often in great abundance, from early April to October from most parts of the county.

Vanessa cardui (L.) (Painted Lady) Reported widely over the county, in places commonly (i.e. Cayton Bay 3–9/8/69, A.M.R.H. and Strensall, 7/8/69; J.H.F.).

V. atalanta (L.) (Red Admiral) Widely reported over county, but not in exceptional numbers.

Eumenis semele (L.) (Grayling) (61) Bardale, 9/8/69; S.M.J.

Aphantopus hyperanthus (L.) (Ringlet) Common in its Wolds localities (S.M.J.) and around Hatfield and Thorne Moors (P.S.).

Acherontia atropos (L.) (Death's Head Hawk) (63) Keighley, early October; A. G. Thorn.

Daphnis nerii (L.) (Oleander Hawk) (64) Baildon, 8/10/69. Picked up in road by Mrs. B. Naughton, the insect having apparently been struck by a car. Of four known records of this rare immigrant in 1969, three others have occurred in S.W. England; C.R.H.

Macroglossum stellatarum (L.) (61) Spurn; S.L.S.

Drymonia ruficornis (Huf.) (Lunar Marbled Brown) (62) Silpho, larvae beaten, 9/8/69; S.M.J.

Tethea ocularis Guenee. (Figure of Eighty) (61) Skipwith Common, fully grown larva on Aspen on 13/8/69; S.M.J.

Orgyia gonostigma (F.) (Scarce Vapourer) (63) Hatfield area, larvae in June; A.M.R.H. Thorne Moors, several larvae in June; P.S.

Saturnia pavonia (L.) (Emperor) (65) Richmond, common on 28/5/69; A.M.R.H.

Drepana lacertinaria (L.) (Scalloped Hook-Tip) (61) Silpho Moor, larva beaten on 9/8/69; S.M.J. This is only the second Yorkshire record for over 30 years.

Celama confusalis (H.-S.) (Least Black Arches) (61) Muston, one on 13/6/69; P.W. Only second record in 20 years.

Amathes triangulum (Huf.) (Double Square-spot) (63) Kebroyd, near Halifax; W.E.C. New record for area, commoner in east of county.

Triphaena interjecta (Hb.) (Least Yellow Underwing) (61) Muston, one at M.V. trap, 20/8/69; P.W. Only other recent Yorkshire record from Spurn.

Stilbia anomala (Haw.) (Anomalous moth) (62) Flask Inn, N. Yorkshire moors, one on 18/8/69; P.W. A new Yorkshire locality.

Anaplectoides prasina (Schiff.) (Green Arches) (62) Hackness, common on 1/8/69; P.W.

Hadena cucubali (Schiff.) (Campion) (63) Halifax, one during 1969; W.E.C.

H. lepida (Esper) (Tawny Shears) (64) Barlow tip near Selby, larvae frequent on Bladder Campion, 22/7/69; S.M.J. Only noted once before in Selby district where foodplant is scarce.

H. serena (Schiff.) (Broad barred White) (61) Staxton, 5/7/69; P.W. (63) Potteric Carr, 5/7/69; P.S.

Eumichtis lichenea (Hb.) (Feathered Ranunculus) (62) Raincliffe woods, 4/10/69; P.W.

Bombycia viminalis (F.) (Minor Shoulder Knot) (62) Falcon Inn, between Whitby and Scarborough, frequent; P.W.

- Apamea scolopacina* (Esper) (Slender Brindle) (63) Kebroyd, near Halifax; W.E.C. (64) Barwick-in-Elmet; S.L.S.
- Brachionycha sphinx* (Huf.) (Sprawler) (63) Wentbridge, 14/6/69, larva beaten in Brocodale Woods; T.F.
- Celaena leucostigma* (Hb.) (Crescent) (64) Fairburn, common; J.D.P.
- Arenostola fluxa* (Hb.) (Mere Wainscot) (64) Becca Hall, near Aberford; S.L.S. (See also *Naturalist*, 1969, p.19.)
- Leucania straminea* Tr. (Southern Wainscot) (61) Spurn; S.L.S. (64) Fairburn; J.D.P. New Yorks. localities.
- L. littoralis* Curtis (Shore Wainscot) (61) Spurn; S.L.S.
- Laphygma exigua* (Hb.) (Small Mottled Willow) (61) Muston, singly at M.V. trap on 20/7 and 19/8/69; P.W.
- Orthosia advena* (Schiff.) (Northern Drab) (63) Carleton, 17/4/69; J.D.P.
- Tiliacea citrargo* (L.) (Orange Sallow) (63) Wentbridge, 31/5/69 and (64) Gateforth on same date, larvae on limes; S.M.J.
- Cucullia verbasci* (L.) (Mullein Moth) (63) Thorne Moor, larvae frequent during June-July; W. Bunting, Jnr.; P.S. (64) Larvae common on Figwort at Sherburn, July; J.D.P.
- Plusia interrogationis* (L.) (Scarce Silver Y) (62) Hackness, two on 1/8/69; P.W.
- Zanclognatha grisealis* (Hb.) (Small Fan-foot) (61) Skipwith Common, 9/7/69; S.M.J. (62) Hackness, larva on 27/9/69; S.M.J. (63) Halifax; W.E.C. Thorne Moors, 12/7/69; P.S. Carleton; J.D.P.
- Brephos parthenias* (L.) (Orange Underwing) (62) Strensall Common, 14/4/69; J.H.F.
- Jodis lactearia* (L.) (Little Emerald) (61) Skipwith Common, 1/7/69; S.M.J.
- Sterrhia emarginata* (L.) (Small Scallop) (62) Strensall Common, 2/8/69; S.M.J.
- Scopula imitaria* (Hb.) (Small Blood-vein) (61) Spurn; P.T.
- Philereme transversata* (Hufn.) (Dark Scallop) (63) Brocodale, 14/8/69; J.D.P.
- Lygris prunata* (L.) (Phoenix) (63) Brocodale, several and (64) Fairburn; J.D.P.
- Mesotype virgata* (Huf.) (Oblique Striped) (61) Taken during 1969 at Spurn by Dr. P. Tannett. New to Yorkshire.
- Thera juniperata* (L.) (Juniper Carpet) (61) Muston near Filey, one at M.V. light, 11/10/69; P.W. Only previously known in Yorkshire from Harrogate, 1968.
- Venusia cambrica* Curtis (Welsh Wave) (62) Hackness, several at light on 9/8/69; P.W., S.M.J. Raincliffe Woods, 19/8/69; P.W.
- Lyncometra ocellata* (L.) (Purple Barred Carpet) (62) Gundale, larva on *Galium verum*, 1/9/69; S.M.J.
- Plemymia biocolorata* (Huf.) (Blue bordered Carpet) (62) Hackness, 9/8/69; S.M.J. Strensall, 7/8/69; A.M.R.H. (64) Towton, 22/7/69; J.D.P.
- Perizoma affinitata* (Steph.) (Rivulet) (62) Hackness, larvae on 27/9/69 (S.M.J.) adults on 9/8/69; S.M.J., P.W.
- P. flavofasciata* (Thun.) (Sandy Carpet) (64) Scholes, 11/6/69; S.L.S.
- Discoloxia blomeri* (Curtis) (Blomer's Rivulet) (62) Hackness, adult at light on 9/8/69 (S.M.J., P.W.), larvae on 27/9/69; S.M.J.
- Eupithecia tripunctaria* H.S. (White-spotted Pug) (64) Bishop Wood, adult on 9/5/69, larvae on *Angelica* on 28/9/69; S.M.J.
- E. subumbrata* (Guenee) (Shaded Pug) (61) Kiplingcotes chalk pit, two larvae on 2/9/69; S.M.J.
- Chlorocystis coronata* (Geyer) (V Pug) (63) Kebroyd and Elland, singly; W.E.C. (64) Selby, in garden on 30/7/69; S.M.J.
- Pelurga comitata* (L.) (Dark Spinach) (61) Barlby near Selby; S.M.J. (64) Scholes, several; S.L.S.
- Nyctosia obstipata* (F.) (Gem) (61) Barlby near Selby, one at light on 8/8/69; S.M.J. (64) One at Scholes on same date; S.L.S.
- Bapta punctata* (F.) (Clouded Silver) (62) Kirkham Abbey, on 12/7/69 (a very late date) and Hackness, larvae on 9/8/69; S.M.J. (63) Brocodale, 17/6/69; J.D.P.
- Ennomos quercinaria* (Huf.) (August Thorn) (61) Muston, one at light on 3/9/69; P.W.
- Apeira syringaria* (L.) (Lilac Thorn) (63) Brocodale, 14/7/69; J.D.P.
- Chiasmia clathrata* (L.) (Latticed Heath) (61) Skipwith Common, 6/7/69; S.M.J. (63) Potteric Carr, abundant on 5/7/69; P.S.
- Zygaena filipendulae* (L.) (Six spot Burnet) (61) Skipwith Common, with *Z. lonicerae*, 6/7/69; S.M.J. An addition to Skipwith list.

- Procis geryon* (Hb.) (Cistus Forester) (61) Ellerburn Bank, 9/6/69; P.W.
Sesia bembeciformis (Hb.) (Lunar Hornet) (64) Haddlesey, near Selby, larvae and pupae noted on willow garth, adults emerged 24/6/69; S.M.J.
Crambus margaritellus (Hb.) (63) Thorne Moors, fairly common during July 1969; P.S.
Acentropus niveus (Ol.) (61) Barlby near Selby, several at light on 4/8/69, not seen there since before the war; S.M.J. (64) Also about the same date at Scholes; S.L.S.
Nymphula stratiotata (L.) (61) Barlby, at least two at light during July 1969; S.M.J.
Euxanthus zoegana (L.) (61) Barlby, a variety taken on 31/7/69; S.M.J. Mainly in chalk areas.
Peronea schalleriana (L.) (61) Barlby, one at light, August 1969; S.M.J.
Yponomeuta padella (L.) (62) Silpho, one on 9/8/69; S.M.J.
Y. evonymella (L.) (64) Grassington, 26/7/69; S.M.J.
Taleporia pseudobombycella (Hb.) (63) Sandall Beat Wood, Doncaster, larval cases collected and adults reared out, 10/5/69; A.G. Boulton; P.S.
Orthotaelia sparganella (Thun.) (62) Strensall Common, 2/8/69; S.M.J. Noted here many years ago by A. Smith.
Coleophora trochilella (Dup.) (63) Thorne Moors, larval cases common on *Carduus* in late summer and autumn 1969; P.S.
Stigmella anomalella (Gz.) (63) Thorne Moors, many mines on *Rosa* leaves in October 1969; P.S.
Mnemonica subpurpurella (Haw.) (63) Sandall Beat Wood, 10/5/69; A. G. Boulton (det. P.S.).

BOTANY

(Dorothy R. Walker): The early part of the winter 1968-69 though mild, was very wet. Drier conditions followed in January which was exceptionally mild. Snowdrops were in flower at Richmond on January 19th and Aconites on the 27th. The same day about 50 Crocuses in flower were counted in Darlington.

At the beginning of February the temperature dropped suddenly, with severe frost and snow lasting until the end of March. In some sheltered hollows around Halifax the snow lasted well into April and in the Pennines a little east of Sedbergh, on May 5th, snow was in many of the north-facing gulleys and also in one south-facing gully, the latter an indication of the quantity of snow which had fallen. Old men up Swaledale state that the spring was the latest in their memory. Some fields in all areas remained fallow because of adverse weather at sowing time and around the county all recorders comment on the lateness, but also the profusion of flowering.

About Thirsk the better weather of May brought on the crops and vegetation was normal by midsummer. There is a fine crop of ash keys, but both here and in Wharfedale the fruiting of other trees is said to have been moderate or poor. *Quercus cerris* at Catton has more acorns than the native oak trees in that area. Around Middlesbrough Almond blossom did not appear until late April when the Cherries were in flower. There were still some Crocus blooms on May 1st.

In Swaledale spring flowers were very late, Celandines still in bloom on 1st June and Hawthorn around Gunnerside on 2nd July. *Polygonum persicaria*—Red Leg—has had a particularly good season, every patch of wasteland being covered with it. *Epipactis leptochila*, in its Richmond station has survived both floods and the uprooting of trees. A third station in the same 10 km square has been found; 17 plants flowered here where it is safe from flooding.

From Halifax it is recorded that one feature of the winter was the amount of damage done to trees and shrubs by the build-up of ice on them breaking off quite large branches and even uprooting some smaller trees by the weight. Great quantities of Beech seedlings appeared in the spring, which showed that a greater number of Beech fruits had ripened than had been realised. Few, however, of these young Beeches can now be found.

The summer has been drier than usual and all areas record good crops of hay, housed early.

In the East Riding flowers generally were late and then came out in profusion and were soon over. There was the best display of Hedge Parsley our recorder had ever seen on some of the banked lanes. It was also noted that some Orchids were particularly floriferous this year. Wild roses, though late were good. The harvest in

the East Riding has been very good and it is reported that even the odd farmer has been heard to admit that it has not been a bad year!

PLANT RECORDS: EAST RIDING (E. Crackles)

The two most notable discoveries made in 1969 are additional records for the rare British species *Oenanthe silaifolia* and *Lathyrus palustris*. Mr. Chicken is the first botanist to recognise *Oenanthe silaifolia* in Yorkshire, finding it in a water meadow near Bubwith. Since this discovery, Dr. Sledge has found a specimen of this species in his herbarium, collected by him in 1937 and believed, at the time, to be the closely related *O. lachenalii*; this specimen was also found near Bubwith, but not in the same meadow. It is also possible that the record for *O. peucedanifolia* for Sutton on Derwent in Baines' *Flora of Yorkshire* (1840) could refer to this species. My own discovery of *Lathyrus palustris* near Thornton is important since previous East Riding records for this species are confined to the vicinity of Beverley and York and it was known to have survived only near Beverley.

Zannichellia gibberosa Reichb. is included in *Z. palustris* L. in Dandy's *List of British Vascular Plants*. Nevertheless, the occurrence of this distinct plant in the freshwater of West Beck (River Hull), whilst the normal form of *Z. palustris* occurs in nearby ponds is of interest and, as far as I know, is the first record for this form in Yorkshire.

The discovery of one plant of *Carex serotina* in a gravel pit at Brandesburton is also notable as the only previous vice-county records for this rare Yorkshire species were for gravel pits near Keyingham. Other rare East Yorkshire species for which an additional locality has been discovered include: *Galeobdolon luteum*, *Bidens tripartita*, *Glyceria declinata*, *Bromus racemosus* and *Alopecurus aequalis*. Miss Taylor has confirmed *Chrysosplenium alternifolium* in its only recorded E. Yorks. station near Settrington and there are two additional records for *Eleocharis uniglumis*, a species first noted in the Riding in 1968.

The large number of interesting records in this report provide ample evidence of much sound and enthusiastic work. The inclusion of a grid-square reference indicates an addition to the distribution as recorded in the *Atlas*, but such additional records for common species are not included.

- Phyllitis scolopendrium* (L.) Newm. Carnaby airfield 54/16; Miss M. Taylor (M.T.).
Asplenium trichomanes L. Settrington 44/87; Y.N.U. Excursion.
Ophioglossum vulgatum L. Lowthorpe 54/06; E. Chicken (E.Ch.). Kiplingcotes chalk quarry 44/94; Hull Nats.
Papaver argemone L. Brandesburton, gravel pit 54/14; E.Ch.
Lepidium campestre (L.) R.Br. Wintringham 44/87; E.Ch.
Cardamine flexuosa With. Burton Bushes Beverley 54/03; Hull Nats.
Barbarea stricta Andrzej. Arram Beck 54/04; M. T. and J. Rushton: also Beverley; M.T.
Arabis hirsuta (L.) Scop. Brandesburton 54/04; Y.N.U. Excursion.
Rorippa islandica (Oeder) Borbás Settrington 44/86; Y.N.U. Excursion.
Hypericum maculatum × *H. perforatum* = *H. × desetangii* Lamotte Water Fulford 44/64; T. F. Medd (T.F.M.).
Silene alba × *S. dioica* Brandesburton, gravel pit 54/04; Y.N.U. Excursion.
Sagina nodosa (L.) Fenzl. Great Givendale 44/85; Miss E. Crackles (E.C.).
Scleranthus annuus L. Brandesburton, gravel pits 54/14; E.Ch.
Trifolium fragiferum L. Near Copper Hall, Skerne 54/05; E.C.
Lotus tenuis Waldst. and Kit. ex Willd. Broomfleet 44/82; M.T.
Vicia tetrasperma (L.) Schreb. Lowthorpe 54/06; E.C. and Miss J. Harris.
Lathyrus palustris L. Near Thornton 44/74; E.C.
Lathyrus montanus Bernh. Beverley Westwood 54/03; M.T.
Saxifraga tridactylites L. North Newbald, confirming an old record 44/93; M.T.
Chrysosplenium alternifolium L. Settrington Wood, confirming the only locality for which this species has been recorded in E. Yorks. 44/86; M.T.
Parnassia palustris L. Brandesburton, gravel pit 54/14; E.Ch.: Carnaby airfield 54/16; M.T.
Myrrhis odorata (L.) Scop. Great Givendale 44/85; T.F.M.
†*Oenanthe silaifolia* Bieb. Bubwith 44/73; E.Ch. New county record.
Silaum silaus (L.) Schinz and Thell. Near Copper Hall, Skerne 54/05; E.C.
Samolus valerandi L. Allerthorpe Common 44/74; E.C.

- Lithospermum officinale* L. Lowthorpe, confirming an old record 54/06; M.T.
Hyoscyamus niger L. North Cave 44/83; M.T.
Pedicularis palustris L. Great Givendale 44/85; E.C.
Thymus pulegioides L. Burdale 44/86; Dr. Hope-Simpson.
Galeobdolon luteum Huds. Near Thorpe Hall 54/16; M.T. Lady MacDonald of Sleat believes this species to be naturally occurring there.
Plantago coronopus L. Ganton 44/97; E.Ch.
Galium mollugo $\times$ *verum* = *G. \times pomeranicum* Retz. Brantingham 44/93; E.C.
Bidens tripartita L. Near Newport 44/83; E.C.
Butomus umbellatus L. Near Newport 44/83; E.C.
Potamogeton perfoliatus L. Near Newport, confirming an old record 44/83; E.C.
Zannichellia gibberosa Reichb. In West Beck 54/05; E.C.
Ophrys apifera Huds. Carnaby airfield 54/16; Miss R. M. Heafford.
Dactylorhiza fuchsii $\times$ *D. maculata* Sand pit, Staxton 54/07; E.C.
Dactylorhiza maculata (L.) So6. Sand pit, Staxton 54/07; E.C.
Dactylorhiza incarnata (L.) So6. Near Thornton 44/74; E.C.
Dactylorhiza purpurella (T. and T. A. Stephenson) So6. Carnaby airfield 54/16; M.T.
Lemna gibba L. Swine moor, Beverley 54/04; M.T.
Typha angustifolia L. Brandesburton 54/04, Thorpe Hall 54/16; E.C.
Scirpus maritimus L. Gravel pit between Brandesburton and Catwick 54/14; E.C.
Scirpus fluitans L. Near Leven Canal 54/04; Dr. D. Shimwell and E.C.
Eleocharis uniglumis (Link) Schult. Gravel pit, near Brandesburton 54/14; Y.N.U.
 Excursion. Water meadow, near Thornton 44/74; E.C.
Carex serotina M6rat. Gravel pit, near Brandesburton 54/04; E.Ch.
Carex pendula Huds. Near Thorpe Hall 54/16; E.C.
Carex ovalis Gooden. Ganton 44/97; E.Ch.
Carex pulicaris L. Wansford 54/05; M.T.
Carex dioica L. Wintringham 44/87; E.C.
Sieglingia decumbens (L.) Bernh. Beverley Westwood 54/03; E.C.
Glyceria plicata Fr. Kings Mill 54/05; M.T.: Settrington 44/86; Y.N.U. Excursion.
Glyceria declinata Br6b. Beverley Westwood 44/03; M.T.
Poa nemoralis L. Settrington 44/87; Y.N.U. Excursion: Thorpe Hall 54/16; E.C.
Catabrosa aquatica (L.) Beauv. Near Boynton 54/16; E.Ch.
Melica uniflora Retz. Near Thorpe Hall 54/16; E.C.
Bromus racemosus L. Water meadow, Thornton 44/74; E.C.
Alopecurus aequalis Sobol. Gravel pit, Brandesburton 54/14; Y.N.U. Excursion.

WEST RIDING: (F. Murgatroyd)

No noteworthy additions to the West Riding flora have been made during the year but a considerable number of additions to the distribution of widespread species as represented in the *Atlas* have been received. The following list includes all but the most common of the additional 10 km-square records.

- Polypodium vulgare* L. (64) 44/04 Goose Eye, Keighley; J. Leedal.
Phyllitis scolopendrium (L.) Newm. (64) 44/22 Arthington Station, Lindley Bridge, Pool Station, Pool Bank; L. Magee.
Asplenium adiantum-nigrum L. (63) 44/02 Old wall near Little Haven, Ripponden; F.M. 44/13 Railway Bridge, Queensbury Station; D. Grant.
Asplenium trichomanes L. (64) 44/24 Arthington Station; L. Magee.
Cystopteris fragilis (L.) Bernh. (64) 44/14 Farnley Village; L. Magee.
Aconitum anglicum Stapf (64) Bolton Abbey, near Storith's Road (introduced); L. Magee.
Ranunculus fluitans Lam. (64) 44/24 Pool Bridge; L. Magee.
Berberis vulgaris L. (64) 44/42 Hedge near Ledsham; F.M.
Arenaria serpyllifolia L. (63) 44/12 In roadway, Upper Shibden. (Introduced with road metal?); F.M.
Minuartia hybrida (Vill.) Schischk. (64) 44/26 Wormald Green quarries; C.M.R.
Thelycrania sanguinea (L.) Fourr. (64) 44/26 Hedgerow, Whitcliffe Lane; C. M. Rob.
Pastinaca sativa L. (63) 44/02 Sowerby Bridge, near River Calder and railway, plentiful; F.M.
Heracleum mantegazzianum Somm. and Levier (64) 44/32 Swillington Ings; F.M.
Foeniculum vulgare Mill. (63) 44/30 Shaw Fields, Barnsley; L. Magee.
Oenanthe fistulosa L. (64) 44/42 Ledston; F.M.

- Parietaria diffusa* L. (63) 44/30 Hound Hill, Barnsley; L. Magee.
Anagallis tenella (L.) L. (63) 43/59 Near Maltby Church; Miss M. R. Shaw.
Centaureum erythraea Rafn. (63) 44/02 Near canal bank at Luddendenfoot; F.M.
Melampyrum pratense L. (64) 44/14 Burley Moor; Mrs. Duncan.
Veronica scutellata L. (64) 44/24 Tunnel Ponds, Bramhope; L. Magee.
Mentha longifolia (L.) Huds. (64) 44/15 Swinsty Reservoir; L. Magee.
Thymus drucei Ronn. (63) 44/02 Waste ground roadside, south-west of Sowerby Bridge; F.M. Possibly introduced with gravel.
Stachys × *ambigua* Sm. (63) 34/92 Canal bank, west of Hebden Bridge; Halifax Scientific Soc.
Doronicum pardalianches L. (64) 44/24 Pool Bridge, Pool Bank, Farnley, roadside; L. Magee.
Luronium natans (L.) Raf. (63) 34/92 Canal, west of Hebden Bridge; F. Utley and F. Horsfall.
Epipactis atrorubens (Hoffm.) Schult. (64) 34/76 Oxenber, Austwick; J. Leedal.
Dactylorhiza maculata subsp. *ericetorum* (E. F. Linton) Hunt & Summerh. (64) 44/25 Pennypot Lane, near Harrogate; L. Magee.
Dactylorhiza purpurella (T. and T. A. Stephenson) Soó (64) 44/25 Pennypot Lane, near Harrogate; L. Magee.
Eriophorum angustifolium Honck. (64) 44/32 Swillington Ings; L. Magee.
Blysmus compressus (L.) Panz. ex Link (63) 43/59 Near Maltby Church; Miss M. R. Shaw. Verification of pre-1930 record in *Atlas*.
Carex pendula Huds. (64) 44/24 Leathley Bridge, 44/34 Harewood Lane, 44/26 Fountains Abbey; L. Magee.
Carex vesicaria L. (64) 44/14 Burley-in-Wharfedale. Confirmation of old record by J. Beanland, 1915; L. Magee.
Carex acuta L. (64) 44/14 Burley-in-Wharfedale. Confirmation of old record by J. Beanland, 1915; L. Magee.
Calamagrostis canescens (Weber) Beck (63) 44/51 Brockadale Woods; Miss M. R. Shaw.

NORTH RIDING: (C. M. Rob)

The list of the more interesting additions to the flora of the two vice-counties is small, so it gives a false picture of the amount of work that has been done during the past year; in particular that by Mr. B. Hingston in the district around Osmotherley. During 1969 he added over 60 species to those shown in the *Atlas* in square 44/49, most of them common plants which had been overlooked.

Both field meetings at Lastingham and Masham were well attended and several interesting records were made. Of these the most outstanding was a fine stand of *Cladium mariscus* at Elmdale near Jervaulx. *Pyrola minor*, which was seen at Swinton near Masham on the same meeting, turned up a week later in a wood near the river Swale above Richmond. *Vicia sylvatica* was a new record for the Lastingham district and *Ranunculus omiophyllus* confirmed an old record for the plant which is more abundant on the western side of the county.

Corrigiola littoralis which is spreading rapidly on railways in the West Riding, has been found by Miss D. M. Ward, a York schoolgirl at Cayton Bay, growing here in damp shingly ground near a path leading down to the beach.

Juncus compressus near Richmond is an interesting addition to the flora of this district. Never a common plant in the North Riding, this appears to be the first record for V.C. 65. It still survives by the roadside just out of Thirsk on the Northallerton road where it is subject to damage by heavy lorries and large doses of salt in frosty times.

Species followed by a grid number are additions to that square; in all, 120 additions to 10 km squares have been reported in the last year.

I am grateful to all who have contributed to this report.

Dryopteris pseudomas (Woll.) Holub & Pouz. (62) Oakdale, Osmotherley 44/49; B. Hingston.

Dryopteris carthusiana (Vill.) H. P. Fuchs (62) Oakdale with above 44/49; B.H. (65) Elmdale 44/18; Y.N.U. meeting.

Ranunculus omiophyllus Ten. (62) Near Lastingham; Y.N.U. meeting.

Vicia sylvatica L. (62) Near Lastingham 44/79; Y.N.U. meeting.

Salix pentandra L. (62) Head of Oakdale, Osmotherley 44/49; B.H.

- Pyrola minor* L. (65) Swinton near Masham 44/27; Y.N.U. meeting. Whitcliffe Wood, Richmond 45/10; Mrs. J. Holloway and C. M. Rob.
Trientalis europaea L. (62) Oakdale, Osmotherley 44/49; B.H.
Erinus alpinus L. (65) Plentiful on an old wall at Middleham 44/18; C.M.R.
Gagea lutea (L.) Ker-Gawl. (65) Near Richmond 45/10; J.H.
Juncus compressus Jacq. (65) Damp field St. Trinians near Richmond 45/10; J.H. and C.M.R.
Schoenus nigricans L. (65) In field below farm at Eelmire 44/18; Dr. W. A. Sledge and G. A. Shaw.
Cladium mariscus (L.) Pohl (65) Eelmire 44/18; Y.N.U. meeting.

CASUALS AND ADVENTIVES: (Mrs. F. Houseman)

Nearly 150 records of plants which can be classed as alien or casual have been sent to me during the past year. These range from waste ground, especially demolition sites, rubbish and wool waste dumps, sand and gravel pits, roadsides, plantations, lawns, old walls and rail track. The ever-increasing spread of some alien plants, e.g. *Veronica filiformis* and *Epilobium pedunculare* continues. The record for *Corrigiola littoralis* is believed to be the first one in V.C. 61.

The following members have contributed: Miss E. Crackles, Mr. E. Chicken, Miss H. Lefevre, Mrs. D. Haythornthwaite, Mr. R. B. Houseman, Mrs. F. Houseman, Mr. I. C. Lawrence, Mr. T. F. Medd, Mrs. T. F. Medd, Dr. G. A. Nelson, Miss C. M. Rob, Miss J. Robertson, Miss M. Taylor and Miss D. Walker.

- Anemone apennina* L. (61) Great Givendale 44/85; T.F.M. (62) Poole Hospital Plantation NZ51; I.C.L.
Brassica juncea (L.) Czern. and Coss. (62) Great Ayton dump NZ51; I.C.L.
Rapistrum rugosum (L.) All. (64) Waste ground, Westgate, Leeds; G.A.N.
Lepidium densiflorum Schrader (64) University car park, Leeds; G.A.N.
Lepidium sativum L. and *Lobularia maritima* (L.) Desv. (64) Quarry Moor dump, Ripon; C.M.R., D.H., D.W.
Sisymbrium orientale L. (61) Burton Fleming 54/07; E.Ch. Welham 44/76; J.R.
Hesperis matronalis L. (62) Waste land, South Gare NZ52; I.C.L. (64) Abundant on reseeded verge, Kilmsey; F.H.
Corrigiola littoralis L. (61) Race track, North Cave 44/83; A. Dobson per E.C. (62) By path to sea at Cayton Bay near Scarborough 54/08; Miss D. M. Ward.
Herniaria cinerea DC. (65) Berryhills, nr. Kirklington; C.M.R.
Claytonia alsinoides Sims (64) Ings, Otley; R.B.H.
Amaranthus thunbergii Moqu. (65) Berryhills, nr. Kirklington; C.M.R.
A. quitensis Humb., Bonpl. and Kunth (63) Greetland tip; F.H.
Chenopodium giganteum D. Don (64) Ings, Otley; F.H.
C. cristatum (F. v. Muell.) F. v. Muell. (65) Berryhills; C.M.R.
Atriplex heterosperma Bunge (63) Greetland tip; F.H.
Oxalis corniculata L. (64) Lawn, Grimston Park, nr. Tadcaster; G.A.N.
Melilotus officinalis (L.) Pall. (61) Kiplingcotes chalk pit 44/94; T.F.M.
M. altissima Thuill. and *M. alba* Medic. (62) Waste ground, Middlesbrough NZ41; I.C.L.
Trifolium glomeratum L., *T. hirtum* All. and *T. tomentosum* L. (65) Berryhills; C.M.R.
Cotoneaster horizontalis Decaisne (64) Several places east of Quarry Moor dump, Ripon; C.M.R., D.W., D.H. Old lime quarry, Wormald Green; C.M.R.
Pyrus communis L. (64) An old tree, Bramhope Ponds; G.A.N.
Grassula macrantha (Hook. f.) Diels (65) Berryhills; C.M.R.
Lythrum junceum Banks and Sol. (64) Quarry Moor dump, Ripon; C.M.R., D.W., D.H. (65) Berryhills; C.M.R.
Epilobium adenocaulon Hausskn. (61) Roadside nr. Skipwith Common 44/63; T.F.M.
E. pedunculare Cunn. (64) Wall on roadside, Linton; H.L.
Daucus glochidiatus (Labill.) Fisch. (65) Berryhills; C.M.R.
Polygonum amplexicaule D. Don (64) Edge of Tolson's lagoons, Otley; G.A.N.
Rumex crystallina Lange (65) Berryhills; C.M.R.
Fagopyrum esculentum Moench (62) Great Ayton dump NL51; I.C.L. (63) Sowerby Bridge; F.H.
Gaultheria shallon Pursh (64) Weetwood Grove, Leeds; G.A.N.
Symphytum orientale L. (61) Great Givendale 44/85; T.F.M.

- Nicotiana glauca* Wheeler (65) Berryhills; C.M.R.
Linaria purpurea (L.) Mill. (64) Roadside, Spofforth to Little Ribston; G.A.N. Quarry Moor dump, Ripon; C.M.R., D.W., D.H.
Veronica filiformis Smith (61) Lowthorpe 54/06; E.Ch. Staxton sand quarry; G.A.N. (62) Abundant, Lastingham; Y.N.U. meeting. (64) Lawns, front of hotel, Rams-gill; G.A.N. (65) Lawn weed, Well; G.A.N.
Mentha spicata L. (64) Quarry Moor dump, Ripon; C.M.R., D.W., D.H.
Hyssopus officinalis L. (64) Ings, Otley; F.H.
Campanula rapunculus L. (64) Roadside nr. Collingham; I.C.L.
Galinsoga ciliata (Raf.) Blake (64) North Street, York 44/55; Mrs. T. F. Medd.
Senecio squalidus L. (61) Nr. Brandesburton 54/14; Y.N.U. meeting. Carnaby 54/16; M.T. (64) Edge of Tolson's lagoons, Otley; F.H.
Centaurea montana L. (64) Old quarry, The Bottoms, Burton Leonard; C.M.R.
C. diluta Ait. (64) Drill Hall yard, Otley; F.H.
Cotula squalida Hook. f. (64) Lawn, Weetwood Hall; G.A.N. per G. A. Shaw.
Galotis hispidula F. Muell., *C. cuneifolia* R. Br., *C. lapulacea* Benth., *Genia turbinata* Pers., *Cotula australis* (Spreng) Hook. f., *Dicrocephala latifolia* DC., *Soliva pterosperma* Juss., *Vittadinia australis* A. Rich., *Danthonia penicillata* (Labill.) F. Muell., *Ehrharia longifolia* Smith, *Phalaris minor* Retz., *Schismus barbatus* (L.) Thell. and *Stipa neesiana* Trin. and Rupr. (65) Berryhills; C.M.R.
Hieracium brunneocroceum Pugsf. (64) Ings, Otley; R.B.H.
Hyacinthoides hispanica (Miller) Rothmaler (64) Brackenthwaite Lane, Beckwithshaw; F.H.
Juncus tenuis Willd. (61) Hull Docks 54/12; E.Ch.
Lolium italicum Lam., *L. temulentum* L., *Panicum miliaceum* L., *Echinochloa crus-galli* (L.) Beauv., *Setaria viridis* (L.) Beauv. and *S. italica* (L.) Beauv. (64) Quarry Moor dump, Ripon; C.M.R., D.W., D.H.
Echinochloa frumentacea Link (63) Sowerby Bridge; F.H.

BRYOLOGY

Two meetings were held by the section during the year. The spring meeting was held in the Hebden Valley in April with the object of examining *Jubula hutchinsiae* in its well-known station. A full account of this meeting has already appeared. The autumn meeting was held at Sedbergh at the end of August in conjunction with the meeting of the B.B.S. A number of new vice-county records were made both in V.C. 69 and 65 and details will be published in due course.

In addition the section produced a report on the bryophytes of Beck Head Wood, Givendale, V.C. 61, at the request of the management committee of the Y.N.T. Several members took part and found the site well worth visiting both for the number of interesting species with at least one new V.C. record and also for the opportunity to assess the ecology of the wood as a whole. It is also hoped to visit Thorne Waste in the near future.

The recorders continue to be grateful for all records, whether common or uncommon, which enable them to build up a picture of the distribution of bryophytes over the County.

MUSCI: (M. Dalby)

Pride of place must go to Mr. and Mrs. Birks' discovery of *Encalypta alpina* on dry limestone cliffs on Ingleborough in June 1968. Ingleborough is mentioned as a station for this plant in Dixon, based apparently on a record of Hooker's, but the record was deleted from the 1926 *Census Catalogue*. The plant has been recorded from a number of Scottish counties, one in Wales and one in Ireland. This is the first recent English record.

Many reservoirs and watercourses have been exceptionally low after the dry summer. *Physcomitrella patens* was abundant at Brownsholme, Burley-in-Wharfedale and Mr. Shaw reports finding numerous male plants of *Discelium nudum* on the edge of Grimwith reservoir in an area subject to inundation. A similar habitat was noted in 1935 by Mr. W. H. Burrell in *The Naturalist* near Langsett reservoir in V.C. 63 when the plants were so numerous that they coloured the shaly slopes red.

(continued on p. 36)

THE YORKSHIRE PROFIT AND LOSS ACCOUNT

EXPENDITURE

1968 £ s. d.		£ s. d.	£ s. d.
	GENERAL PRINTING		
	Circulars	46 5 8	
	Members Cards	36 0 0	
	Sundries	3 10 0	
94 9 3	<i>The Naturalist</i>	955 1 11	85 15 8
	Less sales to non-members	152 10 0	
757 9 9	SUNDRY EXPENSES		802 11 11
50 0 0	Newsletter		70 9 3
34 15 7	Officers Expenses and Postages		46 5 1
5 14 9	Duplicating and Stationery		7 17 0
14 11 6	Bank Charges		10 2 10
3 3 0	Subscriptions and Donations		11 10 0
50 11 2	Surplus		— — —
<u>£1010 15 0</u>			<u>£1034 11 9</u>

BALANCE SHEET as

£ s. d.		£ s. d.	£ s. d.
	ACCUMULATED FUNDS — GENERAL		
	Booth Fund	100 0 0	
	Cheesman Fund	100 0 0	
	R. C. Fowler Jones Legacy	250 0 0	
	E. G. Bayford Legacy	100 0 0	
	R. Chislett Legacy	500 0 0	
	Anonymous Fund	250 0 0	
1300 0 0			1300 0 0
	MYCOLOGICAL FUND		
	Balance brought forward	170 16 5	
	Add Sales <i>Cortinarius</i>	4 9 2	
170 16 5			175 5 7
1147 6 0	ORNITHOLOGICAL FUND CAPITAL		1147 6 0
	ORNITHOLOGICAL FUND REVENUE		
	Balance brought forward	177 2 1	
	Interest on Investments	66 0 0	
177 2 1			243 2 1
	LIFE MEMBERS' ACCOUNT		
	Balance brought forward	107 15 0	
	Less transfer to Subscription Account	15 0 0	
107 15 0			92 15 0
	PROFIT AND LOSS ACCOUNT		
	Balance brought forward	799 7 4	
	Deduct loss	11 16 11	
799 7 4			787 10 5

AUDITORS' REPORT

We have audited the foregoing Income and Expenditure Account and Balance Sheet of the Yorkshire Naturalists' Union with the books, records and vouchers produced to us and certify the same to be in accordance therewith and with the information and explanations we have received.

WHITHAM, SMITH, MITCHELL & CO.,
Chartered Accountants,
4-6 Harrison Road,
Halifax.

31st December 1969

£3702 6 10

£3745 19 1

NATURALISTS' UNION

Year to 30th September, 1969

INCOME

1968			INCOME												
£	s.	d.											£	s.	d.
707	3	5	Subscriptions and Donations	...	...	...	...	...	...	...	...	...	739	9	11
15	0	0	Life Members	...	...	...	...	...	...	...	...	...	15	0	0
142	11	0	Income Tax refund on Covenants	...	...	...	...	...	...	...	...	...	131	11	0
93	17	5	Bank Interest and Dividends	...	...	...	...	...	...	...	...	...	95	11	0
51	19	6	Sale of Publications	...	...	...	...	...	...	...	...	...	41	2	11
3	8		Dollar Adjustment	...	...	...	...	...	...	...	...	...	—	—	—
			Deficit	...	...	...	...	...	...	...	...	...	11	16	11
			CHISLETT MEMORIAL FUND									£	s.	d.	
			Balance brought forward	...	...	...	...	...	...	...	...	...	201	17	7
			Interest received	...	...	...	...	...	...	...	...	...	11	2	0
												212	19	7	
			Lecture costs	...	...	...	...	...	...	...	...	...	36	12	0
			Balance	...	...	...	...	...	...	...	...	...	176	7	7
												£1010 15 0			
												£1034 11 9			

at 30th September, 1969

£	s.	d.					£	s.	d.	£	s.	d.
			INVESTMENT (AT COST)									
			ORNITHOLOGICAL ACCOUNT									
			Nicholas Fund 3% Br. Transport	...	...	...	100	0	0			
			Chislett Legacy									
			£600 Treasury Stock 5½% 2008/12	...	...	...	545	9	0			
			£600 Treasury Stock 5% 1986/89	...	...	...	501	17	0			
										1147	6	0
			GENERAL ACCOUNT									
			Booth Fund 3½% Conversion Stock	...	...	...	100	0	0			
			Cheesman Fund 3½% War Stock	...	...	...	100	0	0			
			4% Consols (B. of E.)	...	...	...	200	0	0			
			4% Consols (P.O.)	...	...	...	159	10	11			
			£386 5½% Treasury Stock 2008/12	...	...	...	250	0	0			
			300 Unilever Ordinary Shares	...	...	...	522	1	6			
			250 Shell Transport Ord. Shares	...	...	...	511	7	0			
										1842	19	5
505	5	5	Less Reserve for Depreciation	...	...	...				2990	5	5
										235	0	0
										2755	5	5
			BANK ACCOUNTS									
			York County T.S.B.	...	...	...	465	16	5			
1013	15	7	Westminster Bank Current A/c	...	...	...	432	6	5			
										898	2	10
			SUNDRY DEBTORS									
			Accrued Interest	...	...	...	21	0	0			
			Tax repayable on Dividends	...	...	...	53	16	10			
183	5	10	Subscriptions due	...	...	...	17	14	0			
										92	10	10
£3702 6 10												
£3745 19												

THE YORKSHIRE PROFIT AND LOSS ACCOUNT

EXPENDITURE			
1968	£ s. d.	£ s. d.	£ s. d.
	GENERAL PRINTING		
	Circulars	46 5 8	
	Members Cards	36 0 0	
	Sundries	3 10 0	
94 9 3	<i>The Naturalist</i>	955 1 11	85 15 8
	Less sales to non-members	152 10 0	
757 9 9			802 11 11
	SUNDRY EXPENSES		
	Newsletter	70 9 3	
	Officers Expenses and Postages	46 5 1	
	Duplicating and Stationery	7 17 0	
	Bank Charges	10 2 10	
	Subscriptions and Donations	11 10 0	
	Surplus	— — —	
£1010 15 0			£1034 11 9

BALANCE SHEET as

£ s. d.	ACCUMULATED FUNDS — GENERAL	£ s. d.	£ s. d.
	Booth Fund	100 0 0	
	Cheesman Fund	100 0 0	
	R. C. Fowler Jones Legacy	250 0 0	
	E. G. Bayford Legacy	100 0 0	
	R. Chislett Legacy	500 0 0	
	Anonymous Fund	250 0 0	
1300 0 0			1300 0 0
	MYCOLOGICAL FUND		
	Balance brought forward	170 16 5	
	Add Sales <i>Cortinarius</i>	4 9 2	
170 16 5			175 5 7
1147 6 0	ORNITHOLOGICAL FUND CAPITAL		1147 6 0
	ORNITHOLOGICAL FUND REVENUE		
	Balance brought forward	177 2 1	
	Interest on Investments	66 0 0	
177 2 1			243 2 1
	LIFE MEMBERS' ACCOUNT		
	Balance brought forward	107 15 0	
	Less transfer to Subscription Account	15 0 0	
107 15 0			92 15 0
	PROFIT AND LOSS ACCOUNT		
	Balance brought forward	799 7 4	
	Deduct loss	11 16 11	
799 7 4			787 10 5

AUDITORS' REPORT

We have audited the foregoing Income and Expenditure Account and Balance Sheet of the Yorkshire Naturalists' Union with the books, records and vouchers produced to us and certify the same to be in accordance therewith and with the information and explanations we have received.

WHITHAM, SMITH, MITCHELL & CO.,

Chartered Accountants,
4-6 Harrison Road,
Halifax.

31st December 1969

£3702 6 10

£3745 19 1

NATURALISTS' UNION

Year to 30th September, 1969

INCOME			
1968	£ s. d.	£ s. d.	£ s. d.
	Subscriptions and Donations		
	Life Members	739 9 11	
	Income Tax refund on Covenants	15 0 0	
142 11 0			131 11 0
93 17 5	Bank Interest and Dividends	95 11 0	
51 19 6	Sale of Publications	41 2 11	
3 8	Dollar Adjustment	— — —	
	Deficit	11 16 11	
	CHISLETT MEMORIAL FUND		
	Balance brought forward	£ s. d.	
	Interest received	201 17 7	
		11 2 0	
	Lecture costs	212 19 7	
		36 12 0	
	Balance	176 7 7	
£1010 15 0			£1034 11 9

at 30th September, 1969

£ s. d.	INVESTMENT (AT COST)	£ s. d.	£ s. d.
	ORNITHOLOGICAL ACCOUNT		
	Nicholas Fund 3% Br. Transport	100 0 0	
	Chislett Legacy		
	£600 Treasury Stock 5 1/2% 2008/12	545 9 0	
	£600 Treasury Stock 5 1/2% 1986/89	501 17 0	
			1147 6 0
	GENERAL ACCOUNT		
	Booth Fund 3 1/2% Conversion Stock	100 0 0	
	Cheesman Fund 3 1/2% War Stock	100 0 0	
	4% Consols (B. of E.)	200 0 0	
	4% Consols (P.O.)	159 10 11	
	£386 9 1/2% Treasury Stock 2008/12	250 0 0	
	300 Unilever Ordinary Shares	522 1 6	
	250 Shell Transport Ord. Shares	511 7 0	
			1842 19 5
105 5 5			2990 5 5
	Less Reserve for Depreciation	235 0 0	
			2755 5 5
	BANK ACCOUNTS		
	York County T.S.B.	465 16 5	
	Westminster Bank Current A/c	432 6 5	
1013 15 7			898 2 10
	SUNDRY DEBTORS		
	Accrued Interest	21 0 0	
	Tax repayable on Dividends	53 16 10	
	Subscriptions due	17 14 0	
183 5 10			92 10 10

£3702 6 10

£3745 19 1

†Denotes new county record. *New vice-county record.

- *35/82 *Ditrichum cylindricum* (Hedw.) Grout (65) Mole hill in pasture nr. Cronkley, October 1968; J. A. Paton.
- *35/91 *Dicranella cerviculata* (Hedw.) Schimp. (65) Bank of stream nr. Balder Head, Baldersdale, October 1968; J. A. Paton.
- †34/77 *Ecalypta alpina* Sm. (64) Dry limestone cliff, Ingleborough, June 1968; Birks and Birks. Confirmation of old – and only – English record.
- *44/85 *Aloina rigida* (Hedw.) Limpr. (61) Greenwick quarry, Huggate, September 1967; J. Robertson.
- †34/77 *Grimmia trichodon* Brid. (64) Dry, west-facing cliffs ca 1,700 ft. on Ingleborough, June 1968; Birks and Birks.
- *54/27 *Bryum micro-erythrocarpum* C.M. and Kindb. (61) Soil on cliff, North Landing, Flamborough Head, February 1968; E. Little.
- **Orthotrichum rupestre* Schleich. ex. Schwaegr. (61) On concrete, Spurn Head, March 1968; E. Little.
- *44/58 *Orthothecium intricatum* (Hartm.) B.S. and G. (62) Limestone rock, Peak Scar, Dale Town, October 1968; Milne-Redhead.
- *44/85 *Plagiothecium curvifolium* Schlieph. ex. Limpr. (61) Beck Head Wood, Great Givendale, February 1969; F. E. Branson.
- *54/27 *P. sylvaticum* (Brid.) B.S. and G. (61) On clay, floor of small wood, Danes Dyke, west of Flamborough, February 1968; E. Little.
- *34/67 *Hypnum cupressiforme* var. *mamillatum* Brid. (64) Woodland bank, Quarry Wood, Twistleton Glen, Ingleton. October 1968; M. Dalby.
- *35/82 *H. cupressiforme* var. *mamillatum* Brid. (65) Rock in birch wood below High Force, Teesdale, October 1968; J. A. Paton.

Nomenclature follows the *Census Catalogue of British Mosses* 3rd edition, E. F. Warburg, 1963.

HEPATICA: (F. E. Branson)

Although the number of records for the year is not very large, yet some interesting items have been reported. Last November Mr. E. Thompson discovered *Ricciocarpus natans* in an old brick pond on the edge of Tadcaster (V.C. 64) on the Wighill Road. Although not new in the vicinity of Tadcaster there are very few records for this water-hepatic. Last December, at Birk Crag near Harrogate (V.C. 64), on a tree trunk in a marsh at the far end of the crag, near the bank of the Oak Beck, I discovered *Prilidium pulcherrimum*. In F. A. Lees' *Flora of West Yorkshire* there is one entry for this in Nidderdale 'Harrogate Heath; R. Teesdale in Linn. Trans. (1798)'. Harrogate Heath was the name to which this area was formerly referred. I can trace no intermediate records between then and this confirmation of Teesdale's record 170 years later. Mrs. Gow recorded both *Cephaloziella hampeana* and *Cephaloziella starkei* from an earthy bank at the foot of a beech tree near a stream at Ringington (V.C. 63) (conf. Mrs. J. A. Paton). Miss Dalby visited Twistleton Glen, Ingleton (V.C. 64) and produced a list of interesting species.

The following list contains items of interest:—

- *34/79 *Sphenobolus minutus* (Schreb.) Steph. (65) From a bank in Uldale, valley of R. Rawthey, August 1969; M. Gow and F. E. Branson.
- 34/79 *Lepidozia trichoclados* K. Mull (65) From a bank in Uldale, valley of R. Rawthey, August 1969; F. E. Branson and M. Gow.
- 44/79 *Lepidozia setacea* (Weber) Mitt. (62) Spaunton Moor, May 1969; J. Robertson.
- 34/67 *Saccogyna viticulosa* (L.) Dum. (64) Twistleton Glen, Ingleton, October 1968; M. Dalby.
- 34/67 *Plagioclila spinulosa* (Dicks.) Dum. (64) Twistleton Glen, Ingleton, October 1968, M. Dalby.
- 34/67 *Drepanolejeunea hamatifolia* (Hook.) Schiffn. (64) Twistleton Glen, Ingleton, October 1968; M. Dalby.
- 34/87 *Cololejeunea calcarea* (Lib.) Schiffn. (64) Halton Gill, July 1969; J. Robertson.
- 34/67 Twistleton Glen, Ingleton, October 1968; M. Dalby.

BOOK REVIEWS

Bird Vocalizations. Essays presented to W. H. Thorpe, edited by **R. A. Hinde**. Pp. xiii + 394 with 37 plates, 64 figures and 8 tables. Cambridge University Press, 1969. 85/-.

This is a volume of sixteen essays presented to W. H. Thorpe by workers in a field in which he was a pioneer. The essays deal primarily with the subsequent developments in this field since the publication of Professor Thorpe's *Bird Song* in 1961. The important steps forward in this subject, as the original book showed, are founded on the technique which makes it possible to analyse and present the sound of bird vocalizations in visual form, i.e. by the use of the sound spectrograph. Though this method may have its limitations it is giving us an understanding of several of the components of bird song.

The editor has grouped the essays into sections, each covering a different aspect, namely the physical, developmental, physiological, functional, evolutionary and literary and aesthetic. Since they are written by the foremost workers in those fields this is basically a book for specialists, but there are a number of most interesting facts which emerge. The three essays in the developmental section by Konishi and Nottebohm, Stevenson and Immelmann point to the conclusion that some birds have a preformed template of their species-characteristic song and their own performance of it improves with their experience of it, the final song pattern developing gradually from the sub-song. The degree and nature of control of the vocalizations by the nervous system and by hormones is discussed in the physiological section together with the reverse situation of the effect of vocalizations on the endocrine states of other individuals. This leads naturally to the functional section in which the use of song and vocalizations as a means of communication and a behavioural influence between individuals is considered in its varying aspects. Another of the newer fields is the use of voiced sounds in taxonomic studies to augment the information from morphological and zoogeographical data. The book is charmingly concluded with a couple of essays on the literary and aesthetic aspects of bird song.

A notable feature of the book is the introduction to each section provided by the editor. Professor Hinde has not only achieved the almost impossible by giving cohesion to sixteen individual essays but has made a most valuable contribution by deftly putting each section into its biological perspective and thus emphasising for the reader the importance of each study.

I.W.

The Zoology of Tropical Africa by **J. L. Cloudsley-Thompson**. Pp. xv + 355 with 32 plates and 41 text figures. The World Naturalist Series; Weidenfeld and Nicolson, London. 1969. 84/-

Anyone with an interest in Africa and an inquisitive approach to life will find this a most interesting book. Professor Cloudsley-Thompson takes an objective look at the continent and provides the sort of information the intelligent naturalist wants to know. He confines himself to regions which have a tropical climate for at least a large part of the year, thus excluding the Mediterranean coastland and the southernmost tip.

The book begins by setting the scene climatically and pre-historically, goes on to discuss the present day relief, soils and vegetation and, in the first few chapters, the types of animals, vertebrate and invertebrate, to be found in the various regions: rain forest, savanna, scrub and desert, montane regions, freshwater, mangrove swamps and coral reefs. These are followed by a couple of chapters of general ecological considerations, including population changes and short and long-term rhythms. Then there are three chapters of a physiological nature about types of adaptations found amongst the animals to humid or dry heat, concluding with a chapter on man as an ecological factor incorporating a brief survey of the parasitic diseases of the continent.

The book therefore has an extremely wide scope and could be said to suffer from this in so far as many fascinating aspects are all too briefly just mentioned and not expanded. Specialists may well feel frustrated but there is a bibliography to allow them to pursue their interest more deeply. Also the author is constantly drawing attention not only to what is known but also to what is not known and how much research remains to be done.

This is a book which appears to fulfil a need for comprehensive information about the tropical African fauna and with the growing tourist trade to the area, gives a most useful perspective view.

I.W.

Badgers at my Window by Phil Drabble. Pp. 159, with 20 black and white photographs. Pelham Books, 1969. 30/-.

Books featuring the doings of tame Badgers are numerous, but unfortunately very few approach the standard of this work by Phil Drabble. Readers who are familiar with his earlier book *Weasel in my Meatsafe*, will know what I mean; Mr. Drabble has an infectious style and his enthusiasm, humour and problems, draw the reader into the subject of his writing.

This book is not about tame Badgers as such, but deals with the author's attempts to create ideal conditions for Badger watching by setting up a colony near his home. His early trials and tribulations and his later successes are graphically described and one shares his pleasures and disappointments all the way. The descriptions of his Badger's first contacts with wild relatives are probably unique in the field of animal behaviour and his evidence in favour of Badgers in situations which often lead to their destruction as pests is noteworthy. If ever a Badgers' advocate is needed, Mr. Drabble is the man.

The illegal control method of gassing and the barbarity of 'digging' are discussed sensibly, as are the impracticalities of protection laws which could never be enforced on large estates. The author's practise of 'stinking out' sett with Reynardine in localities where the Badgers were threatened with destruction is something which field naturalists might find a use for. The smell and effect are temporary, but Badgers can be moved out of harm's way for a time by this means. In this book one sett so emptied was otherwise going to be demolished by explosives with the Badgers probably still inside it.

This is a good book and can be strongly recommended, not only for its factual content and easy style, but as an antidote to some of the sentiment and/or hysteria which tends to gather round the life of a hunted carnivore. I personally would rather hear of Badger hams hanging from country cottage beams than of 'Badgers pining their hearts out in little zoos of ill repute'. And with Mr. Drabble's desire to 'throttle' an ill-informed, anti-Badger fanatic, I am in complete sympathy.

T.M.C.

The Otter Report by Marie N. Stephens. Pp. 88, with 4 text figures. Universities Federation for Animal Welfare. 1957, reprinted 1969. 8/-.

The Humane Control of Animals Living in the Wild. Based on the U.F.A.W. Symposium of 23rd January 1969. Universities Federation for Animal Welfare, 1969. 8/-.

These two works have sufficient in common to allow a joint review. The first-mentioned is a reprint of a report which was called for to examine the status of the Otter as a threatened species, a quarry for hunters and a real or potential pest of fisheries. The result is a classic of fact-gathering on an elusive subject, and a document of lasting value which should be on the shelves of every mammal student. The need for further information on the Otter in recent years has been great, but it will probably be a long time before we have a further work equal in quality to this one. The Yorkshire Ouse River Board's area is one in which the species is considered to be numerous; whether this still applies is, I feel, a subject for investigation by local naturalists. If this report does nothing else but send people out looking for Otters it will have achieved a great deal. If 'frequently seen' rather than 'frequently shot' appears in the summary concerning its status in the Yorkshire Dales in any subsequent report, I for one will be very pleased.

In the second work, Ministry of Agriculture, Forestry and Game experts, and also commercial pest control agencies, combined their information under the chairmanship of Dr. F. Fraser Darling. Shooting, trapping, poisoning and narcotising, follow on each others heels as means to various ends. The common denominator is how control can be achieved without excessive cruelty. The subject is one over which feelings run high but it is only through symposia and reports of this kind that any progress can be made. The closing paragraph of the introduction sums up rather well the background against which some of these undoubted pests must be viewed. I quote, 'When living creatures get out of hand through man's mistakes and miscalculations they should not be caused to suffer unnecessarily. Control of numbers may be justified: inhumanity is certainly not'. This should be required reading for 'sportsman' and 'animal-lover' everywhere.

T.M.C.

Animal Partnerships by **Maurice Burton**. Pp. 107, with 14 black and white photographs and numerous text drawings. Frederick Warne and Co., 1969. £1.

This is rather a slim volume to devote to such a vast subject but at least it has the virtues of being up-to-date and written by Dr. Burton.

Feeding and breeding associations come off worst in terms of space and examples, but these are compensated by the sections on barber fishes and cleaning shrimps, sea anemones and their partners, sponge and crab associations and ants and their guests. All these topics have been the subject of intensive recent research and Dr. Burton has gathered information on these studies together for the first time.

The author is nothing if not bold and he plunges into murky waters on the subject of House mice and their evolution. Whilst it is generally acknowledged that there are ecotypical forms of *Mus musculus*, their stability is in doubt, and the disappearance of House mice on St. Kilda after the human evacuation may have been due as much to competition from the Wood Mouse, which is a big robust form, as to any withdrawal of human support.

Throughout, the emphasis is on partnership in a symbiotic sense. Parasitism is not dealt with, but would seem to be ideal as a subject for a companion book, written in the same fresh and energetic style.

T.M.C.

The Ornithological Society of Turkey: Bird Report 1966-1967. Pp. 169, published June 1969. Obtainable from the Secretary, Ornithological Society of Turkey, 90 The Lodge, Sandy, Bedfordshire. 12/6.

This first report of a society founded only in 1967 draws attention to Turkey's great diversity of unspoilt habitat, to her being a land-bridge between S.E. Europe and Western Asia and to her consequently serving as a natural main route for migrant birds. The introduction also describes the geo-physical and climatic features of the various regions. When wanting to relate the maps on pp. V and VI, I found it a source of irritation that they face in opposite directions.

To achieve a speedy production, the systematic list (which occupies the whole of the 169 pages and which follows Vaurie's order) was divided between the six members (all British) of the Records and Editorial Committee, and they can congratulate themselves that any differences in style etc. do not obtrude. The scientific, English and, where possible, Turkish names are given for each species. A summary of the known status within Turkey (whether migrant or resident, common or rare, etc.) is followed by more detailed information and/or specific records for each of seven regions. Naturally, breeding localities for rarities are not named and it is to be hoped that they will not be passed on from person to person as is so often the case.

Inexplicably there is no general summary for Jackdaw. I doubt if this is the place to comment on the Penduline Tit that it 'requires a fairly specialised type of habitat' and it is questionable if the comments 'requiring conifers' of Coal Tit and 'Habitat requirements appear not be specialised' (Nuthatch) are entirely valid; in any case they are out of place in the present context.

Mention of such an area conjures up visions of pelicans, herons, egrets. One is not likely to be disappointed. Less appreciated in the past has been the potential of Turkey's wetlands. Winter counts of wildfowl include 5,000 Greylags, 17,000 White-fronts, 1,750 Ruddy Shelduck, 45,000 Teal, 105,000 Wigeon, 70,000 Pintail, 23,000 Shoveler, 22,000 Pochard etc. Marbled Teal, Ruddy Shelduck and Red-crested Pochard are among the more exotic breeders.

Thirty-five species of birds of prey are listed, some of them occurring in spectacular migrations at Bosphorus. Most of our more familiar waders are seen on passage though few of these breed. Instead we have such breeding waders as Black-winged Stilt, Avocet and Kentish Plover. Breeding has been proved for the Greater Sand Plover, 1,000 miles west of its previously known range. Similarly a westerly extension of range has been established for the Crimson-winged Finch.

This really sets the pattern for the whole report. We are in explorers' country. Time and again one comes across such comments as 'Records suggest breeding', 'No definite records of breeding', or (of the rare Olive-tree Warbler) 'More records would be gratefully received'. The report will doubtless stimulate more interest in the birds of Turkey and encourage more expeditions to that country. For the would-be traveller the report is a must.

R.F.D.

A New Check List of the Birds of the Lancaster District written and published by the Lancaster and District Bird Watching Society, 1969. 7/6.

Though the era of Check Lists of very local interest is coming to a close, it was with eager hope and anticipation that we awaited this one, giving an up-to-date summary of the birds of an interesting corner of Lancashire which includes Morecambe Bay, the Lune Valley and the R.S.P.B. Reserve of Leighton Moss. Yet our hopes have not been realised.

This is probably mainly due to finance: yet so flourishing a Society could surely afford more than 23 pages of birds and a maximum of twelve lines of print per species (most having much less). But even with this drastic cut on space the omissions and inaccuracies are many.

Bean Goose at Pilling Marsh (1963), Great Snipe on the Lune (1959), Temminck's Stint at Pilling (1873), Pomarine Skua at Leighton Moss (1962) and Great Reed Warbler at Leighton Moss (1963) are among a host of overlooked birds.

Many of the inaccuracies are due to a mix-up of terminology and give the wrong impression of the numbers of many species. For example the Black-throated Diver is 'rare' (yet there are 12 records since 1950), Great Northern Diver 'very rare' (eight records since 1950), Rednecked Grebe 'very scarce' (11 records since 1950), Spoonbill 'rare' (three records since 1950) and Iceland Gull 'very irregular' (four records since 1950). Surely this is a misleading mix-up of terms. Also Shag appearances are not coincident 'with periods of onshore gales' nor are Sanderling 'decidedly uncommon in winter'. This type of error is common.

It is also very niggling when a species is described as 'very rare visitor' as, for example, in the Golden Eagle, with no further details on numbers, and when the initials of a person are printed next to a bird he didn't see, as in the 1968 Marsh Sandpiper.

In a local publication of this sort accuracy is of paramount importance, together with a good synoptical presentation of the available data. It is a pity that this has not been achieved here.

M.E.G.

The Mystery of Animal Migration by **Matthieu Ricard** (English version by Peter J. Whitehead). Pp. 209 with 16 photographic plates and 46 maps and diagrams. Constable, 1969. 45/-.

Drawing on the findings of many specialists, the author brings together into this one modest volume interesting information on the migratory habits of a wide variety of animals. Thirty-four pages are devoted to mammals, 118 to birds, 26 to fishes, 20 to insects and three to amphibians, reptiles and crustaceans together. Of this total, more than 30 full pages are taken up with maps. From this alone one will conclude that there is a lack of depth in the accounts. That the migrations of bison, springbok, wapiti, reindeer, seals, whales, bats and lemmings (*inter alia*) are covered in a mere 34 pages serves to emphasize how general are the terms. Mouse-eared bats and lemmings, and in other sections, locusts, eels and salmon, are treated in more detail than most.

The section on birds refers particularly to those of Europe. Some of the misleading statements it contains should not have been allowed to pass in translation. (The translator is a principal scientific officer at the department of zoology in the South Kensington Natural History Museum). Owing to the tarsus being so short, we are told, rings are fixed to the angle of the wing in swifts and martins; the Little Grebe is described as tail-less; Great Bustards move south from Scandinavian countries to escape from the cold and snow; Sanderling occasionally visit Britain; a Heligoland trap is used for catching water-birds. Is it, in fact, established that a Fulmar's nasal tubes are designed for excreting excess salt?

We are given such elementary information as that the Ring Ousel has a striking white stripe across its throat, or that the Spoonbill has 'a little tassel of feathers behind its head but its most distinctive feature is the flattened spoon-like tip to its bill'. We are told how to recognise a Wheatear in flight, and are provided with the general pattern of the (male only) Redstart and Stonechat. On the other hand there are discussions on the degeneration of social behaviour in animals when over-crowded; on the theories of such workers as Sauer, Matthews and Kramer; and on the conclusion that migratory behaviour is a cyclic feature and a regulatory mechanism essential in the maintenance of biological equilibrium.

These different standards make it difficult to determine what kind of audience the author hoped to reach.

R.F.D.

The Entomologist's Record

and Journal of Variation

A monthly illustrated magazine, founded by J. W. Tutt in 1890, is devoted mainly to the Lepidoptera of the British Isles. It also deals with other orders of insects especially Coleoptera, Diptera, Hymenoptera, Orthoptera. Its articles include descriptions of new species and varieties, reports on collecting trips, distribution, habits and habitats of insects and of collecting and study techniques suitable for novice and expert. It circulates in 47 countries.

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IRISH NATURALISTS' JOURNAL

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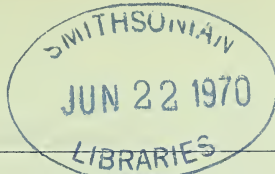
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Principally for the North of England

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THE PLANT COMMUNITIES OF ILKLEY MOOR

J. H. FIDLER, MARY DALBY and JOAN E. DUNCAN

This article is part of a series of papers on the Survey of Ilkley Moor by the Wharfedale Naturalists' Society.

1. INTRODUCTION

In 1903 Smith and Rankin published a paper in the *Geographical Journal* on "The Geographical Distribution of Vegetation in Yorkshire" which showed Ilkley Moor as a predominantly heather moor. Almost 60 years later members of the Wharfedale Naturalists' Society realised that considerable changes had taken place in the vegetation of the Moor since that time and started the present survey in 1959.

One very noticeable change was the great increase of crowberry (*Empetrum nigrum*) over large areas and the ecology of this species on the Moor has been the subject of an earlier paper (Dalby, *The Naturalist* 1961, 37-40).

After the preliminary work of this survey it became clear that a more intensive study of the whole vegetation was needed before an accurate assessment of the changes could be made. It was soon realised that mapping the vegetation would be difficult and time-consuming and the opportunity of using aerial photographs was welcomed. The present paper aims to show the plant communities as they were in 1963-64 when they were mapped from an aerial survey, subsequently investigated on the ground and the results analysed.

For a description of the geology of Ilkley Moor reference should be made to the recent paper by Mr. P. D. Lamming (*The Naturalist* 1969, 53-54).

2. TOPOGRAPHY

Ilkley and Burley Moors are part of the main massif of Rombalds Moor, lying between the valleys of the Aire and the Wharfe. They have a north east aspect, being bounded by Addingham Moorside on the west and Hawksworth, Bingley and Morton Moors on the south. The area chosen for the survey is that within the Ilkley Urban District Boundary, running from Crawshaw Moss on the west to Horncliffe House in the south and bounded by the natural boundaries of the moor above Burley and the Woodhead road.

The contour rises from 500 feet to 1,321 at the highest point, dividing the moor into three well marked areas: the lower slopes, the "edges" and the upper plateaux, the latter lying for the most part above the 1,000 foot contour. No details of rainfall on the higher parts of the moor are available, but records for Ilkley itself show an average over the ten years 1959-68 of 35.16 inches and in the Pennines all ground over 1,000 ft. has an estimated annual rainfall of 40 inches or over.

The lower slopes rise fairly steeply to approximately the 1,000 ft. contour and due to an enormous landslide from Rocky Valley to Barmishaw, much of the area here is extremely stony with huge boulders scattered over the surface. The slopes are intersected by four main ghylls through which run Coldstone, Cow Close, Spicey and Black Becks. In addition there are smaller streams including Rushy Beck and that flowing over Willy Hall's Spout. There are eight small plantations on the slopes stretching from Hangingstones in the east to Silver Well in the west. Several quarries have been used in the past but all are now abandoned. The most extensive are Hangingstones, Cow and Calf and Weary Hill quarries.

The "edges" are the steep cliff faces below the upper plateaux which lie for the most part above the 1,000 ft. contour rising gradually to the highest part of the moor.

3. METHOD USED

As a result of obtaining a grant of £50 from the Carnegie Trust, a set of aerial photographs was taken of the whole moor area on the 30th May, 1963 by Dr. J. K. St. Joseph of Selwyn College, Cambridge. These consist of some 63 overlapping prints, size 8" x 8", representing a scale of about 18" to the mile. These photographs were used as a basis for the mapping of the various plant communities noted on the ground.

Preliminary knowledge of the plant communities on Ilkley Moor suggested that some seven could probably be recognised, each characterised by a dominant species:- *Callunetum*, dominated by heather, *Vaccinietum* by bilberry, *Juncetum* by rushes, *Eriophoretum* by cotton grass, *Pteridietum* by bracken, *Nardetum* by grasses and a small area (*Molinietum*) dominated by purple moor grass. Crowberry, being so ubiquitous, was not considered as a community. In addition there were some eight plantations of conifers and numerous small bogs which were not studied at this stage.

Mapping of the communities so defined was carried out by numerous members of the Society walking over the area represented by each photograph and marking on a plastic cover the various communities. The boundaries of these communities could be seen clearly on the aerial photographs.

Finally, when all areas had been examined, the boundaries of the communities were traced onto a master map drawn to the same scale as that occupied by the aerial photographs. This scale was not uniform over the whole area, being rather smaller where the steep slope of the northern scarp occurred and adjustments had to be made to the master map so that it represents a vertical perspective of the area as a whole.

4. MAPPING THE COMMUNITIES

The master map so constructed was of a very complicated nature largely owing to the intricacies of the often small areas occupied by each community. For analysis and publication, therefore, a further set of maps was required. These were constructed from the master map using a grid of 100 metre squares. Where a square was fully occupied by a community a dot was entered in this square but where it was shared with another community a diagonal line was placed in the square. Each map (Fig 2-8) thus represents an indication of the distribution of that particular community over the whole moor.

5. ANALYSIS OF COMMUNITIES

In order to confirm that the seven communities, arbitrarily selected and mapped as described above, were in fact ecologically valid, an analysis of their constitution was undertaken. To do this about three areas typical of each community were selected and metre quadrats examined, about 20 quadrats per site, each quadrat being located at random within the boundaries of the community.

All species of plants occurring within these quadrats were recorded together with their percentage cover within the quadrat. These are listed in Table 1. The cover is quoted on the Domin scale as follows:-

DOMIN SCALE (modified)

Cover	Scale Value	Cover	Scale Value
90 - 100 %	10	10 - 25 %	5
75 - 90	9	5 - 10	4
50 - 75	8	5 (scattered)	3
33 - 50	7	4 (v.scattered)	2
25 - 33	6	(scarce)	1

The frequency of occurrence of each species in the quadrats is quoted on a scale of 0 - 10 and the plant cover in each community as a mean percentage.

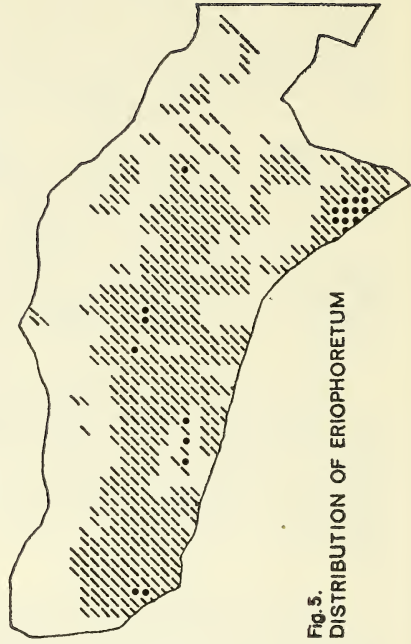
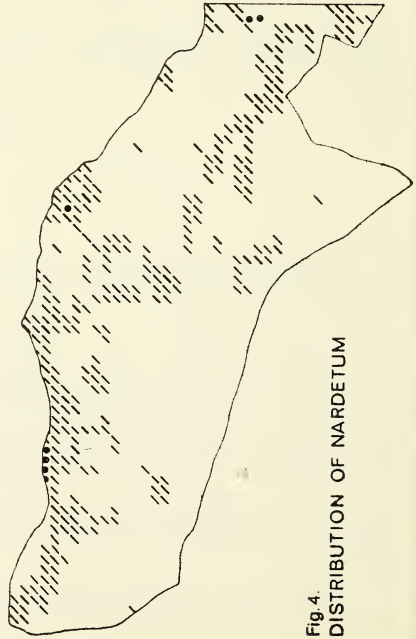
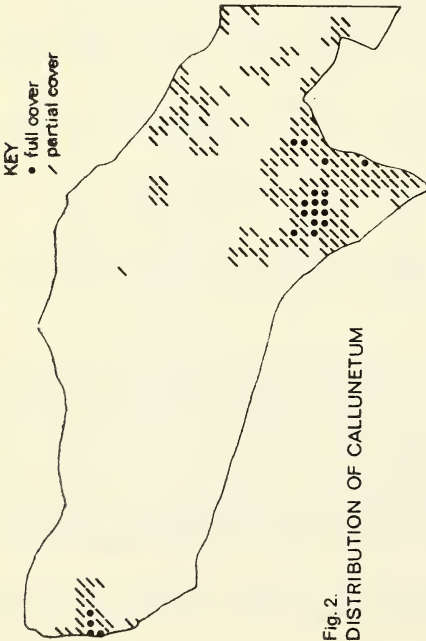
6. COMMENTS ON THE COMMUNITIES

It will be seen from Table 1 that the total number of species occurring in each community is rather low when compared with other lists published from similar habitats. The greatest number of species occurred in the *Juncetum* (21, of which 7 were mosses), while the lowest was in the *Pteridietum* where only 9 species were recorded. However ground cover was high, being near 100% in most communities with the exception of the *Pteridietum* where it was as low as 91.6%.

Crowberry (*Empetrum nigrum*) occurred in all communities having a mean frequency figure of 6.8 and a Domin value as high as 5.6. The only other species to occur in all communities was *Juncus squarrosus*, but here the frequency was only 1.8, with a Domin value of 1.7.

Examination of Table 1 shows that there is a marked difference between the species which occur in the various communities and that the species which was selected

MAPS OF DISTRIBUTION OF COMMUNITIES ON ILKLEY MOOR



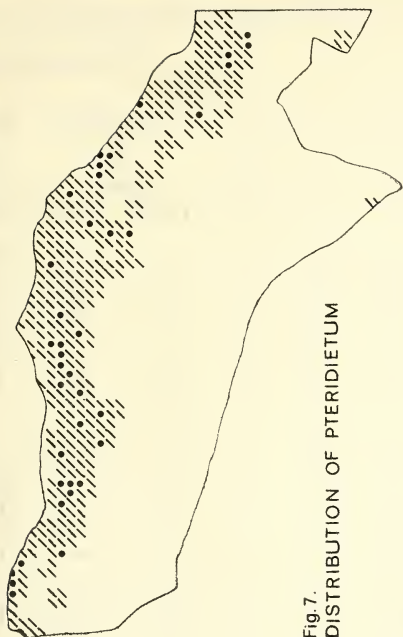


Fig. 7.
DISTRIBUTION OF PTERIDIETUM

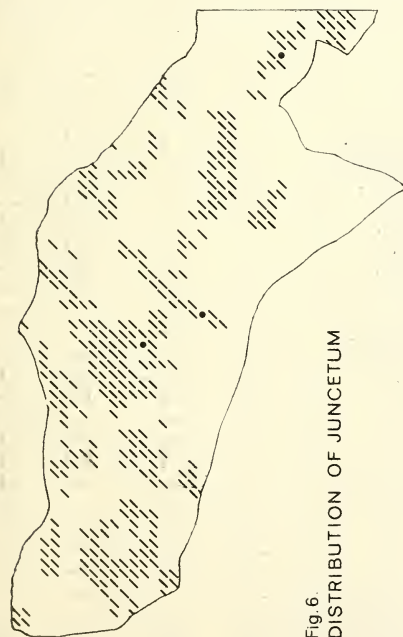


Fig. 6.
DISTRIBUTION OF JUNCETUM

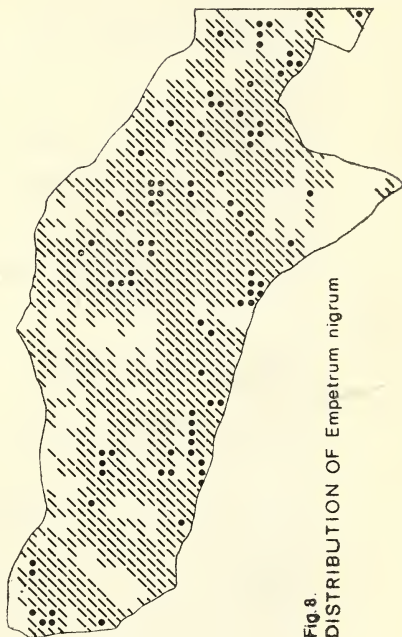


Fig. 8.
DISTRIBUTION OF Empetrum nigrum

Table 1. Floristic Composition of the
Cover-abundance

Community	Callunetum				Vaccinieta	
Number of Sites	4				3	
Number of Quadrats	90				104	
Percentage Cover	100				98.6	
	Domin	Freq.	Domin.	Freq.	Domin.	Freq.
Dicot Herbs						
<i>Achillea millefolium</i> L. ...	—	—	—	—	—	—
<i>Calluna vulgaris</i> (L.) Hull ...	7	9.6	2	—	—	—
<i>Empetrum nigrum</i> L. ...	5	4.9	6	—	—	—
<i>Erica tetralix</i> L. ...	1	0.3	—	—	—	—
<i>Galium saxatile</i> L. ...	—	—	—	—	—	—
<i>Potentilla erecta</i> (L.) Rausch. ...	—	—	—	—	—	—
<i>Vaccinium myrtillus</i> L....	1	0.6	7	—	—	—
<i>Vaccinium oxycoccus</i> L. ...	—	—	—	—	—	—
Grasses						
<i>Agrostis stolonifera</i> L. ...	—	—	—	—	—	—
<i>Agrostis tenuis</i> Sibth. ...	—	—	—	—	—	—
<i>Deschampsia flexuosa</i> (L.) Trin. ...	—	—	4	—	—	—
<i>Festuca ovina</i> L. ...	—	—	1	—	—	—
<i>Molinia caerulea</i> (L.) Moench ...	—	—	—	—	—	—
<i>Nardus stricta</i> L. ...	—	—	1	—	—	—
Sedges and other Monocots						
<i>Carex nigra</i> (L.) Reich. ...	—	—	—	—	—	—
<i>Eriophorum angustifolium</i> Honck. ...	5	3.8	1	—	—	—
<i>Eriophorum vaginatum</i> L. ...	4	1.8	—	—	—	—
<i>Juncus effusus</i> L. ...	—	—	—	—	—	—
<i>Juncus squarrosus</i> L. ...	1	0.7	1	—	—	—
<i>Luzula campestris</i> (L.) DC. ...	—	—	—	—	—	—
<i>Luzula multiflora</i> (Retz.) Lej. ...	—	—	—	—	—	—
Ferns						
<i>Dryopteris dilatata</i> (Hoffm.) Gray ...	—	—	—	—	—	—
<i>Peridium aquilinum</i> (L.) Kuhn ...	—	—	4	—	—	—
Mosses and Liverworts						
<i>Acrocladium stramineum</i> (Brid.) R. & W. ...	1	0.1	—	—	—	—
<i>Barbilophozia floerkei</i> (W. & M.) Loeske ...	—	—	1	—	—	—
<i>Bryum pseudotriquetrum</i> (Hedw.) Schw. ...	—	—	—	—	—	—
<i>Calypogeia fissa</i> (L.) Raddi ...	1	0.1	—	—	—	—
<i>Calypogeia muellerana</i> (Schf.) K. Mull. ...	—	—	1	—	—	—
<i>Campylopus flexuosus</i> (Hedw.) Brid. ...	2	0.1	—	—	—	—
<i>Campylopus pyriformis</i> (Schultz) Brid. ...	2	0.2	—	—	—	—
<i>Cephalozia bicuspidata</i> (L.) Dum. ...	—	—	—	—	—	—
<i>Ceratodon purpureus</i> (Hedw.) Brid. ...	—	—	—	—	—	—
<i>Drepanocladus aduncus</i> (Hedw.) Warnst. ...	—	—	—	—	—	—
<i>Drepanocladus revolvens</i> (Turn.) Warnst. ...	—	—	—	—	—	—
<i>Dicranum scoparium</i> Hedw. ...	—	—	1	—	—	—
<i>Gymnocolea inflata</i> (Huds.) Dum. ...	2	0.3	—	—	—	—
<i>Hypnum cupressiforme</i> Hedw. ...	—	—	—	—	—	—
<i>Lepidozia reptans</i> (L.) Dum. ...	—	—	1	—	—	—
<i>Orthodontium lineare</i> Schwaegr. ...	1	0.2	1	—	—	—
<i>Plagiothecium undulatum</i> (Hedw.) B. & S. ...	—	—	1	—	—	—
<i>Pohlia nutans</i> (Hedw.) Lindb. ...	—	—	—	—	—	—
<i>Polytrichum commune</i> Hedw. ...	—	—	—	—	—	—
<i>Sphagnum fimbriatum</i> Wils. ...	—	—	—	—	—	—
<i>Sphagnum recurvum</i> P. Beauv. ...	—	—	—	—	—	—
<i>Sphagnum subsecundum</i> agg. ...	—	—	—	—	—	—
Total Species	13				15	
Mean Domin value	2.54				2.20	
Mean Frequency	1.75				1.75	

Various Communities in Terms of Mean (Domin) and Frequency

rdetum	Eriophoretum		Juncetum		Molinietum		Pteridietum	
3	3		3		1		3	
25	50		60		23		63	
00	99.5		100		99.9		91.6	
in Freq.	Domin.	Freq.	Domin	Freq.	Domin	Freq.	Domin	Freq.
0.4	—	—	—	—	—	—	—	—
—	1	3.8	1	0.2	2	4.8	1	1.4
5.6	7	9.0	4	4.3	6	10.0	6	5.7
—	1	0.4	1	0.3	5	1.6	—	—
0.8	—	—	1	0.3	—	—	—	—
0.4	—	—	—	—	—	—	—	—
—	1	2.8	—	—	1	0.4	4	5.7
—	1	0.4	—	—	—	—	—	—
—	—	—	1	0.7	—	—	—	—
2.0	—	—	1	1.3	—	—	—	—
8.8	1	2.2	2	7.2	1	0.9	5	6.3
5.6	—	—	—	—	—	—	—	—
—	2	1.4	—	—	6	10.0	—	—
9.2	1	1.2	2	1.3	—	—	—	—
—	3	1.8	1	0.7	1	1.7	—	—
—	4	4.6	2	4.5	2	4.3	1	0.3
—	7	7.2	1	0.3	2	1.1	—	—
0.8	—	—	8	10.0	—	—	—	—
2.8	2	2.0	1	0.2	4	4.8	2	1.4
0.8	—	—	—	—	—	—	—	—
0.4	—	—	—	—	—	—	—	—
—	—	—	1	0.2	—	—	—	—
—	1	0.2	—	—	—	—	5	6.2
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
—	—	—	1	0.1	—	—	—	—
—	—	—	1	0.1	—	—	—	—
—	—	—	—	—	1	2.6	—	—
0.2	—	—	—	—	—	—	—	—
—	—	—	—	—	1	0.4	—	—
—	—	—	—	—	2	2.6	—	—
—	—	—	—	—	—	—	2	2.4
—	2	3.0	—	—	1	0.4	—	—
—	—	—	—	—	1	0.4	—	—
—	2	1.2	—	—	2	1.3	—	—
1.6	—	—	—	—	—	—	—	—
0.4	—	—	1	0.1	—	—	—	—
—	1	0.6	—	—	—	—	3	4.0
—	—	—	—	—	—	—	—	—
0.8	—	—	1	0.1	—	—	—	—
—	—	—	2	4.3	—	—	—	—
—	1	0.8	—	—	—	—	—	—
—	—	—	5	8.5	2	1.7	—	—
—	—	—	2	1.0	—	—	—	—
16	17	21	17	9				
5	2.24	1.90	2.35	3.22				
3.35	2.51	2.18	2.89	3.71				

Table 1. Floristic Composition of the Various Communities in Terms of Mean Cover-abundance (Domin) and Frequency

Community	Callunetum		Vaccinietum		Nardetum		Eriophoretum		Juncetum		Molinietum		Pteridietum	
Number of Sites	4		3		3		3		3		1		3	
Number of Quadrats	90		104		25		50		60		23		63	
Percentage Cover	100		98.6		100		99.5		100		99.9		91.6	
	Domin	Freq.	Domin	Freq.	Domin	Freq.	Domin	Freq.	Domin	Freq.	Domin	Freq.	Domin	Freq.
Dicot Herbs														
<i>Achillea millefolium</i> L. ...	7	9.6	2	3.2	1	0.4	1	3.8	1	0.2	2	4.8	1	1.4
<i>Calluna vulgaris</i> (L.) Hull ...	5	4.9	6	8.7	5	5.6	7	9.0	4	4.3	6	10.0	6	5.7
<i>Empetrum nigrum</i> L. ...	1	0.3	—	—	—	—	1	0.4	1	0.3	5	1.6	—	—
<i>Erica tetralix</i> L. ...	—	—	—	—	1	0.8	—	—	1	0.3	—	—	—	—
<i>Galium saxatile</i> L. ...	—	—	—	—	1	0.4	—	—	—	—	—	—	—	—
<i>Plantaginella erecta</i> (L.) Rausch. ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<i>Vaccinium myrtillus</i> L. ...	1	0.6	7	9.2	—	—	1	2.8	—	—	1	0.4	4	5.7
<i>Vaccinium oxycoccus</i> L. ...	—	—	—	—	—	—	1	0.4	—	—	—	—	—	—
Grasses														
<i>Agrostis stolonifera</i> L. ...	—	—	—	—	—	—	—	—	1	0.7	—	—	—	—
<i>Agrostis tenuis</i> Sibth. ...	—	—	—	—	1	2.0	—	—	1	1.3	—	—	—	—
<i>Deschampsia flexuosa</i> (L.) Trin. ...	—	—	4	8.4	—	8.8	1	2.2	2	7.2	1	0.9	5	6.3
<i>Festuca ovina</i> L. ...	—	—	1	0.4	—	5.6	—	—	—	—	—	—	—	—
<i>Malina caerulea</i> (L.) Moench ...	—	—	—	—	—	—	2	1.4	—	—	6	10.0	—	—
<i>Nardus stricta</i> L. ...	—	—	1	0.7	—	9.2	1	1.2	2	1.3	—	—	—	—
Sedges and other Monocots														
<i>Carex nigra</i> (L.) Reich. ...	—	—	—	—	—	—	3	1.8	1	0.7	1	1.7	—	—
<i>Eriophorum angustifolium</i> Honck. ...	5	3.8	1	0.7	—	—	4	4.6	2	4.5	2	4.3	1	0.3
<i>Eriophorum vaginatum</i> L. ...	4	1.8	—	—	—	—	7	7.2	1	0.3	2	1.1	—	—
<i>Juncus effusus</i> L. ...	—	—	—	—	1	0.8	—	—	8	10.0	—	—	—	—
<i>Juncus squarrosus</i> L. ...	1	0.7	1	0.9	—	2.8	2	2.0	1	0.2	4	4.8	2	1.4
<i>Luzula campestris</i> (L.) DC. ...	—	—	—	—	—	0.8	—	—	—	—	—	—	—	—
<i>Luzula multiflora</i> (Retz.) Lej. ...	—	—	—	—	1	0.4	—	—	—	—	—	—	—	—
Ferns														
<i>Dryopteris dilatata</i> (Hoffm.) Gray ...	—	—	—	—	—	—	1	—	1	0.2	—	—	—	—
<i>Pteridium aquilinum</i> (L.) Kuhn ...	—	—	4	19.6	—	—	—	0.2	—	—	—	—	5	6.2
Mosses and Liverworts														
<i>Acrascladum stramineum</i> (Brid.) R. & W. ...	1	0.1	—	—	—	—	—	—	—	—	—	—	—	—
<i>Barbilotaphia floerkei</i> (W. & M.) Loeske ...	—	—	1	0.7	—	—	—	—	—	—	—	—	—	—
<i>Bryum pseudotriquetrum</i> (Hedw.) Schw. ...	—	—	—	—	—	—	—	—	1	0.1	—	—	—	—
<i>Calypogeia fissula</i> (L.) Raddi ...	1	0.1	—	—	—	—	—	—	1	0.1	—	—	—	—
<i>Calypogeia muelleriana</i> (Schf.) K. Mull. ...	—	—	1	0.7	—	—	—	—	—	—	1	2.6	—	—
<i>Campylaplex flexuosus</i> (Hedw.) Brid. ...	2	0.1	—	—	1	0.2	—	—	—	—	—	—	—	—
<i>Campylaplex pyrifolius</i> (Schultz) Brid. ...	2	0.2	—	—	—	—	—	—	—	—	1	0.4	—	—
<i>Cephalozia bicuspidata</i> (L.) Dum. ...	—	—	—	—	—	—	—	—	—	—	2	2.6	—	—
<i>Ceratodon purpureus</i> (Hedw.) Brid. ...	—	—	—	—	—	—	—	—	—	—	—	—	2	2.4
<i>Drepanocladus aduncus</i> (Hedw.) Warnst. ...	—	—	—	—	—	—	2	3.0	—	—	1	0.4	—	—
<i>Drepanocladus revolvens</i> (Turn.) Warnst. ...	—	—	—	—	—	—	—	—	—	—	1	0.4	—	—
<i>Dicranum scoparium</i> Hedw. ...	—	—	1	0.7	—	—	—	—	—	—	—	—	—	—
<i>Gymnocolea inflata</i> (Huds.) Dum. ...	2	0.3	—	—	—	—	2	1.2	—	—	2	1.3	—	—
<i>Hypnum cupressiforme</i> Hedw. ...	—	—	—	—	—	1.6	—	—	—	—	—	—	—	—
<i>Lepidozia reptans</i> (L.) Dum. ...	—	—	1	0.4	—	0.4	—	—	1	0.1	—	—	—	—
<i>Orchodanthium lineare</i> Schwaegr. ...	1	0.2	1	0.7	—	—	1	0.6	—	—	—	—	3	4.0
<i>Plagiathecium undulatum</i> (Hedw.) B. & S. ...	—	—	1	0.7	—	—	—	—	—	—	—	—	—	—
<i>Pohlia nutans</i> (Hedw.) Lindb. ...	—	—	—	—	1	0.8	—	—	1	0.1	—	—	—	—
<i>Polytrichum commune</i> Hedw. ...	—	—	—	—	—	—	—	—	2	4.3	—	—	—	—
<i>Sphagnum fimbriatum</i> Wils. ...	—	—	—	—	—	—	1	0.8	—	—	—	—	—	—
<i>Sphagnum recurvum</i> P. Beauv. ...	—	—	—	—	—	—	—	—	5	8.5	2	1.7	—	—
<i>Sphagnum subsecundum</i> agg. ...	—	—	—	—	—	—	—	—	2	1.0	—	—	—	—
Total Species	13		15		16		17		21		17		9	
Mean Domin value	2.54		2.20		2.06		2.24		1.90		2.35		3.22	
Mean Frequency	1.75		—		3.35		2.51		2.18		2.89		3.71	

as characterising each community had the highest Domin value (mean of 6.7) and frequency (mean of 8.8) in each case (when *Empetrum nigrum* is excluded). It was concluded, therefore, that the arbitrary selection of communities had been well founded on botanical grounds.

As described above, separate maps (Figs 2-8) were constructed for the analysis of the various communities. It will be seen that the *Pteridietum* occurs only on the northern scarp, except for a small patch at the southernmost tip of Burley Moor where the altitude again falls. In fact this community appears to have an upper limit near the 1,100 ft. contour, although exposure to the south-westerly winds appears to have a more adverse effect than altitude.

The *Eriophoretum* occurs mainly on the plateaux on the top of the moor where the drainage is poor. The comparatively level areas at the foot of the scarp are better drained and are covered with grasses (*Nardetum*). The *Nardetum* also occurs on better drained areas sloping down to the east towards Burley. The *Juncetum* occupies an intermediate and somewhat overlapping situation between the *Eriophoretum* and the *Nardetum* where drainage is impeded but standing water is less common.

The distribution of *Callunetum* is more difficult to explain and has occupied a separate study in this survey, details of which will be published later. In the main, except for small relict patches occurring all over the better drained areas of the Moor, the only large areas of heather remaining occur at the junction with Addingham Moor and at the Burley end. It is now considered that the loss of heather from the remainder of the Moor is largely due to the heavy stocking with sheep during and after the World wars.

Vaccinietum occurs in small patches on most of the better drained areas of the Moor, but only becomes extensive in two main areas, one on a steep slope just above the grassy area at the western end of the Moor, the other on a slope further south above the main *Eriophoretum*. It is apparent that the limiting factor here is better drainage and a lower pressure of sheep grazing.

The remaining map shows the distribution of crowberry (*Empetrum nigrum*). It will be seen that this species occurs almost all over the Moor, often as an exclusive dominant. It is, in fact, only absent from those areas in which heather is still the dominant species and even here appears gradually to be taking over.

7. CONCLUSION

The survey described above both emphasises and adds to the preliminary observations of the area being studied.

Crowberry, which is found to be predominant over practically the whole of the Moor, can be seen in quantity by the casual observer, but the map, as well as showing the localities of dominant crowberry, demonstrates its encroachment into every community. The table indicates the high Domin value of crowberry in each community and enables its frequency in the communities to be compared.

The mapping which has been done makes an interesting contrast against the 1903 map of Smith and Rankin, but it will be even more valuable for future comparisons thanks to the aerial survey methods available. The community analysis is a record of the status of the species present and by similar investigations in the future the extent of any changes may be determined.

In the present analysis the comparative paucity of species within the communities has been brought out. This is in spite of the fact that the plant species list for the Moor is quite large, the greater number of species occurring in localities outside the defined communities.

In conclusion it is suggested that since the communities studied have species numbers which are small even for an acid moor, the invasion of crowberry may be a significant factor.

A survey of this nature is ideal for a naturalists' society in that members without advanced knowledge of ecology can, under guidance, help to amass the records and data needed for analysis. The writers acknowledge the full part played by their fellow members in the Wharfedale Naturalists' Society. They in their turn are indebted for the help and guidance given so generously by Dr. D. D. Bartley of the Botany Department of Leeds University.

A LICHENOLOGICAL EXCURSION THROUGH THE NORTH OF ENGLAND

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Although in the last fifteen years there has been a revival of interest in the lichen flora of the British Isles, surprisingly little work has been done in the north of England, resulting in a large gap in the known distribution of many species between south-east England and central and western Scotland. In order to help rectify this the authors, accompanied by Dr. O. L. Gilbert, Mr. B. Ducker, and Miss M. Johnson for various parts of the excursion, visited 66 localities (MAP 1) in Nottinghamshire (V.C. 56), North-east Yorkshire (V.C. 62), North Yorkshire (V.C. 65), Durham (V.C. 66), South Northumberland (V.C. 67), Westmorland (V.C. 69) and Cumberland (V.C. 70), between 28th May 1969 and 5th June 1969.

A large number of records, particularly of corticolous species, were made, including at least 140 vice-county records of lichens; and it is the purpose of the present paper only to list and discuss briefly the more interesting species and localities. Full details of our research have been incorporated into the British Lichen Society's Mapping Scheme. Species not previously published as occurring in particular vice-counties are prefixed with an asterisk (*). The nomenclature is that of James (1965, 1966) with more recent amendments to bring it up to date. Authorities are given for most names which differ from those used in James (1965, 1966).

On our way northwards we stopped briefly in the Major Oak area of Sherwood Forest (loc. 1: SK 622680), Nottinghamshire, which, despite the huge oak trees still standing, was surprisingly poor in species. Only eight species were recorded: **Cladonia coniocraea*, *C. macilenta*, *C. squamosa* s.l., **Lecanora conizaeoides*, **Lecidea granulosa*, **L. scalaris*, **L. uliginosa*, and **Lepraria incana*; foliose lichens were completely absent. The paucity of the lichen flora here, as that in adjacent Derbyshire (Hawksworth, 1969), appears to be almost entirely due to the effects of air pollution, although a reduction of the water table due to mining must also be considered here. Similar areas of old woodland in south-east England often have more than 90, even over 100, corticolous species (cf. Hawksworth and Rose, 1969).

Several localities in the Castle Howard area of north-east Yorkshire (locs. 2-7) were examined but again pollution-sensitive species were absent or extremely rare, though the situation was definitely better than at Sherwood: only in one, Atkinson's Pond (loc. 4: SE 705700) was an *Usnea* (indeterminable to the specific level) seen. Old trees adjacent to the Castle (loc. 2: SE 712699) bore only 20 species including *Phlyctis argena*, *Cladonia digitata*, *Lecidea quercea*, *L. scalaris*, and **Schismatomma decolorans* (on *Tilia*). *Evernia prunastri*, *Hypogymnia physodes* (L.) Nyl. (= *Parmelia physodes* (L.) Ach.) and *Parmelia saxatilis* occurred but were mainly restricted to the bases of the trees. The usnic acid absent and present races of *Haematomma coccineum* (var. *porphyrium* and var. *coccineum* respectively) grew adjacent to each other on the Obelisk (loc. 3: SE 710699) where *Caloplaca hepiana*, *Lepraria incana*, **L. crassissima*, and *Rinodina subexigua* were also of interest. The woods at the north end of Atkinson's Pond had, in addition to the *Usnea*, *Chaenotheca ferruginea*, *Lecanactis abietina* (fertile), **Ochrolechia yasudae*, and **Pertusaria hemisphaerica*. Most other woods in the area had been replanted and were poor in lichens, including Coneysthorpe Wood where Mr. R. Teesdale found *Lobaria scrobiculata* prior to 1805 (Turner and Dillwyn, 1805). A single *Crataegus* near Brandrith Wood (loc. 7: SE 709691), however, had 14 species including *Calicium viride*, *Ochrolechia androgyna*, *Parmeliopsis ambigua*, and *Pertusaria coccodes*.

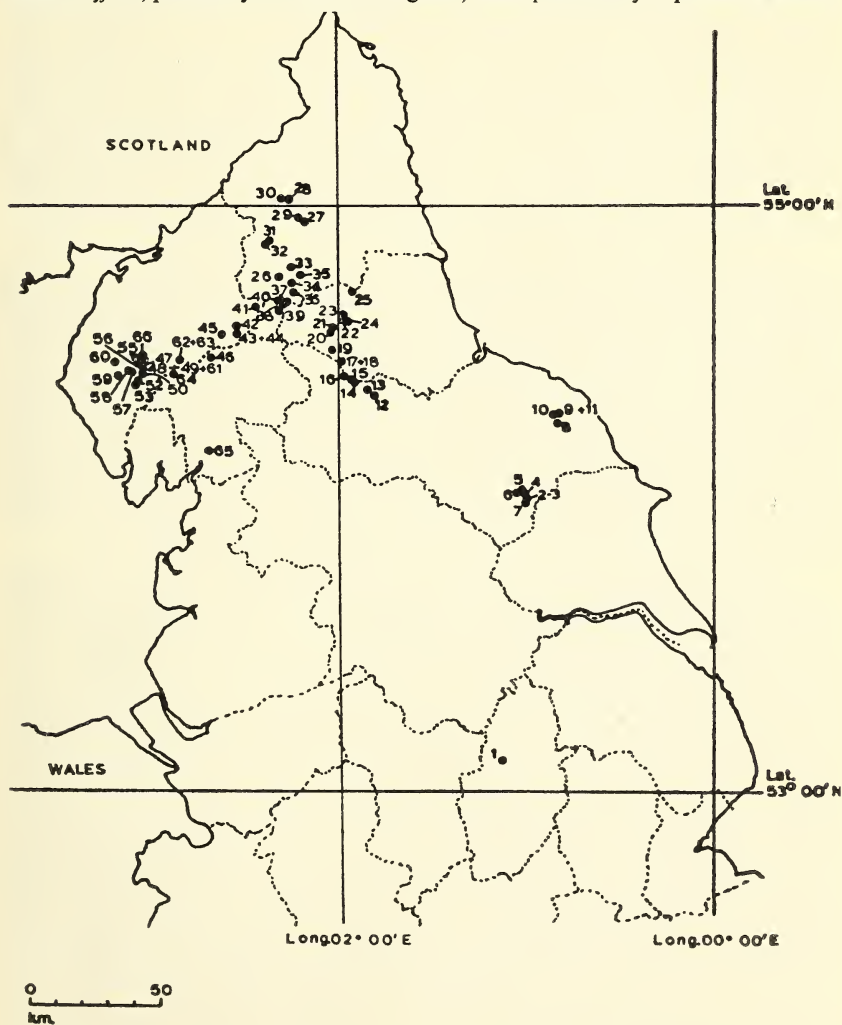
The Goathland area, being further away from the industrial areas of the North Midlands, and with a more varied topography, was more interesting, although trees in exposed situations were generally poor. A few sandstone boulders in *Callunetum* at Moorgates (loc. 8: SE 844994) had the federation *Umbilicaria cylindrica* but this was poor in species: *Acarospora fuscata*, *Haematomma ventosum* (sterile; thamnolic and divaricatic acids only), *Lecanora badia*, *L. cinerea*, *L. polytropa*, *L. rupicola*, *Lecidea sulphurea*, *L. tumida*, *Parmelia omphalodes*, **Pseudevernia furfuracea* var. *ceratea* (Ach.) D. Hawksw. (= *Parmelia furfuracea* p.p.; atranorin and olivetoric acid), and *Umbilicaria polyphylla*, were characteristic showing that they belonged to the union *Parmelietum omphalodis* (cf. Hawksworth, 1969). Ravines near Goathland (locs. 9-10) were much richer in species, presumably because of their being sheltered from much of the atmospheric pollution, and more humid (c.f. the 'ravines' of the Wyre Forest, and the limestone 'dales' of Derbyshire). The gorge between Beck Hole and Thomason Force (loc. 9: NZ 825022) yielded **Cystocoleus niger*, *Graphis elegans*, *G. scripta*, **Lecanora intricata* var. *soralifera*, *Rhizocarpon petraeum*, and *Thelotrema lepadinum*, but the total of 27 species, and the scarcity of many of them, contrasted markedly with the relatively rich flora of the Mallyan Spout Gorge (loc. 10: NZ 824009) which totalled 42 species. *Arthonia didyma*, *Arthopyrenia punctiformis*, *Peltigera horizontalis*, *Pertusaria leioplaca*, *P. multipuncta*, *Racodium rupestre* and *Stenocybe septata* were the more interesting finds at Mallyan, but we were surprised by the absence of *Enterographa crassa*, although many seemingly suitable habitats occurred; indeed this species seems to be rare in the north of England and was only seen once on this excursion – at Shipley Wood (loc. 18) in Durham.

Corticolous species, except for the ubiquitous *Lecanora conizaeoides*, were not seen along the road from York to Scotch Corner; but beyond that, a great change occurred. In North Yorkshire (V.C. 65) a single old *Fraxinus* by the A66 near Dalton (loc. 12: NZ 140099) was surprisingly rich in species of the federation *Xanthorion* of which it had 31; including *Anaptychia ciliaris*, *Buellia alboatra*, *B. canescens*, **Caloplaca aurantiaca*, *C. cerina*, **Candelariella xanthostigma*, *Bacidia rubella*, **Buellia punctata*, *Physcia adglutinata* (Flörke) Nyl. (= *P. elaeina* (Sm.) A.L.Sm.), **P. adscendens*, *P. aipolia*, **P. farrea* (Ach.) Vain. (= *P. grisea* pro parte), **P. grisea*, *P. orbicularis*, **P. pulverulenta*, and *Ramalina farinacea* s.l. This tree, whose flora was very similar to many in south-eastern England and north-east Herefordshire, was apparently not typical of trees of this area; ash trees south of Hutton Magna (loc. 13: NZ 122107) lacked *Anaptychia ciliaris* and *Physcia adglutinata* but had 22 species including several not seen near Dalton (e.g. **Ochrolechia yasudae*, *Pertusaria albescens* var. *corallina*, **Ramalina farinacea* var. *hypoprotocetrarica* (Culb.) D. Hawksw., *R. fastigiata*, *Xanthoria candelaria*, **X. polycarpa*). A wall nearby proved quite interesting with *Lecanora calcarea* and **Solenopsora candicans*. The floras of trees 1 mile north-west of Rokeby Hall (loc. 14: NZ 07-14-) and south-east of Egglestone Grange (loc. 15: NZ 067148) were similar, but those near Egglestone Grange added **Caloplaca citrina* f. *phlogina* (Ach.) D. Hawksw. (= *C. citrina* pro parte), **Catillaria griffithii*, **Cladonia coniocraea*, **Lepraria candelaris*, **L. incana*, **Ochrolechia turneri*, and **Pertusaria albescens* var. *albescens* to V.C. 65, and also bore fertile *Anaptychia ciliaris*.

At Lartington Hall (loc. 16: NZ 02-17-) we were surprised by the luxuriance of the lichen flora. *Anaptychia ciliaris* was abundant and fertile in a rich *Xanthorion* with *Ramalina fraxinea*, *Physcia aipolia*, **P. farrea* etc.; and **Parmelia exasperatula* and **P. tiliacea* were frequent on *Acer pseudoplatanus*. 60 species were found here, others of interest including **Calicium viride*, **Lecidea querneae*, and **Pertusaria coccodes* on trees; and *Caloplaca ferruginea*, **C. holocarpa* and **Candelariella medians* on walls. Woods by the river Balder near Cotherstone (loc. 17: NZ 013202) had a rather similar flora to that seen earlier in the ravines of Goathland (locs. 9-10) but were rather richer in species including *Arthonia punctiformis*, **A. radiata*, **A. spadicea*, **Arthopyrenia antecellans*, **Cystocoleus niger*, **Lecidea scalaris*, **Pertusaria flavida* (in better lit situations), **P. hemisphaerica* and *P. hymenea*. *Pseudevernia furfuracea* var. *furfuracea* (atranorin and physodic acid) occurred as one small plant on *Alnus glutinosa* immediately by the river in a rather sheltered situation; this is the furthest north in the British Isles that this generally southern chemical race has been found. The var. *ceratea* (atranorin and olivetoric acid) is occasional on walls and well-lit trees throughout the north of England.

Shipley Wood, by the river Tees north of Cotherstone and near Eggleston (loc. 18: NZ 014204) in Durham (V.C. 66) was even richer than those on the Yorkshire side

of the river. 84 species were noted, many of which were either new or had not been reported from Durham this century. The most notable of these were **Catillaria sphaeroides*, *Lobaria laetevirens*, *L. pulmonaria* and *Peltigera horizontalis* which occurred on one old inclined *Fraxinus*. *L. pulmonaria* was also present in plenty on a very old *Fraxinus* pollard nearby. Both these *Lobaria* species had been reported from this locality by the Rev. J. Harriman before about 1800 (Turner and Dillwyn, 1805), but not apparently since then. Other notable species here were **Arthonia didyma*, **A. punctiformis*, **A. radiata*, **Arthopyrenia punctiformis*, **A. fallax*, **Cladonia squamosa* var. *allosquamosa* Hennipm. (= *C. subsquamosa*), **Enterographa crassa*, **Graphina anguina*, *Lepraria candelaris*, **L. incana*, **Leptogium lichenoides*, **Micaria prasina* (on *Ulex*), **Ochrolechia androgyna*, *Opegrapha herbarum*, *O. varia*, **Pertusaria albescens* var. *albescens*, **P. flavida*, **P. hemisphaerica*, **Racodium rupestre*, and *Usnea subfloridana*. **Bacidia affinis*, previously unknown in England, was a particularly important find here.



Map of the north of England to show the localities visited (-----, indicates county boundaries).

The lichen flora as a whole was thus rather similar to that of wooded ravines in south-east England, and the moderate-rainfall areas of south Devonshire and the Lake District, but for the conspicuous lack of *Parmelia caperata* in this, the Teesdale area.

Brief stops were made while travelling between Barnard Castle and Castleside, near Consett (locs. 19-24) some of which proved interesting: *Alectoria fuscescens* (the first time we had seen it on this excursion), **Parmeliopsis ambigua*, and **P. hyperopta* occurred on *Acer pseudoplatanus* by the B6278 1.6 miles north of Egglestone (loc. 19: NY 989260); **Candelariella aurella*, and **Lecanora intricata* var. *soralifera* were found on a roadside wall by Bollilhope Burn (loc. 21: NY 994349); and **Phlyctis argena* occurred on *Ulmus* at Rogerley Hall, near Frosterley (loc. 23: NZ 01-37-).

The Horsley Hope Ravine, two miles west of Castleside (loc. 25: NZ 06-48/9-) and only four miles west-south-west of the Consett steel works, was surprisingly rich and yielded 66 species, the more interesting of which were in sheltered ravines. **Arthonia didyma*, **A. spadicea*, *Alectoria fuscescens*, **Catillaria sphaeroides*, **Dimerella diluta*, **Lecidea cinnabarina*, **Gyalecta flotowii*, *Opegrapha varia*, **O. vermicellifera*, **Pertusaria albescent* var. *corallina*, **P. coccodes*, *Thelotrema lepadinum*, and **Stenocybe septata* were of especial note so near to such an intense source of air pollution (the recording station at NZ 106510 recorded average concentrations of 121 µgm/m³ smoke and 117 µgm/m³ sulphur dioxide between April 1963 and March 1967; *vide* Ministry of Technology, 1964-1967). But the flora here appears to be partially protected from its effects by both the topography, and its location with respect to the south-westerly prevailing winds. The *Lobaria* spp. recorded in this area in Turner & Dillwyn (1805) were not however refound, but we did not explore the most southerly ravine at all.

In south Northumberland (V.C. 67) we first visited Whitfield Park (loc. 26: NY 77/8-55/6-), in West Allen Dale, which had 73 corticolous lichens. Several ancient oak and ash trees were present and proved rich in 'parkland' species including **Arthonia impolita*, *Arthopyrenia alba*, **A. biformis*, **A. fallax*, *Lecania cyrtella*, *Lobaria pulmonaria* (south-west facing side of one *Fraxinus* in an open situation; patch about 0.75 m²: this species has since been found to be abundant in an adjacent wooded ravine by Dr. O. L. Gilbert (Gilbert, *in litt.*)), **Pachyphiale cornea*, **Schismatomma decolorans*, *Thelotrema lepadinum*, and *Usnea ceratina*. *Alectoria fuscescens* was frequent on both younger trees and horizontal boughs of older ones, and **A. subcana* occurred on one *Acer pseudoplatanus* in a rather sheltered situation in a shrubbery near the Hall itself. Other notable species here were *Calicium abietinum*, *C. salicinum*, *Caloplaca aurantiaca*, *C. cerina*, **Candelariella xanthostigma*, **Catillaria griffithii*, **Lecidea scalaris*, **Lepraria incana*, **Parmelia aspera*, **P. elegantula*, **P. tiliacea*, **Pertusaria coccodes*, **P. flavida*, **P. hemisphaerica*, **Ochrolechia yasudae*, *Phlyctis argena*, and **Physcia farrea*.

Nunwick Castle Park (loc. 27: NY 8--7--), near Simonburn, was poorer in species than Whitfield Park, but *Lecanora polytropa* occurred on an iron gate, and **Cladonia furcata* subsp. *subrangiformis* (Sandst.) D. Hawksw. (= *C. subrangiformis*) was found on the top of a somewhat calcareous wall. Dr. O. L. Gilbert also showed us an old sycamore by the main road adjoining the park with *Ramalina fraxinea* (subsp. *fraxinea* and subsp. *caliciformis*; fronds up to 15 × 2 cm.), *R. fastigiata*, *R. farinacea* var. *farinacea*, and **R. subfarinacea* var. *reagens* (B. de Lesd.) D. Hawksw. (= *R. farinacea* var. *reagens*). The bark bearing these Ramalinae was breaking away and they appear to be in danger of extinction here. Hesleyside Park, 1.5 miles west of Bellingham (loc. 28: NY 81-83-) was much richer, particularly the ravine which yielded **Arthonia didyma*, **A. spadicea*, **Buellia disciformis*, **Graphis elegans*, **Haematomma elatinum* (on *Fagus*; new to the north of England but also seen later at locs. 52, 56, 61 and 63 in the Lake District), **Parmeliopsis hyperopta* (on *Fagus*), **Pertusaria hemisphaerica* and **P. multipuncta*. A very interesting *Caloplaca*, as yet undetermined, was abundant on a single elm tree in an open situation in the centre of the park; and **Cystocoleus niger* was collected from a wall by the main entrance to the Hall. Our finds here spurred us on to visit the Wark Burn Gorge, near Woodley Shield (loc. 29: NY 8--7--), which proved rather disappointing apart from the finding of *Coniocybe furfuracea* (fertile) on the base of one old *Fraxinus* (a species only previously collected in Northumberland by Mr. N. J. Winch early last century), and **Catillaria sphaeroides*. Low Carrith wood, 2 miles west of Bellingham (loc. 30: NY 79-83-) was even poorer in species, although *Alectoria fuscescens* was abundant on the birch trees with fronds up to 30 cm. in length, forming the subassociation *alectoriosum jubatae* of the *Parmeliatum fur-*

Laecaeae. The flora of Low Carrith Wood was more 'upland' in character and remarkably similar to the common open woodland types of epiphytic vegetation characteristic of central, southern and eastern Scotland, rather than to that of south-east England or 'atlantic' areas.

Brief stops were made in 15 localities (locs. 31-45) in the North Pennines. **Parmelia exasperatula* was seen on *Fraxinus* at High Field, near Catton (loc. 33: NY 829584), on *Acer pseudoplatanus* at Nentbury, (1.5 miles north-west of Nenthead (loc. 40: NY 764451), and at Edenhall, 1 mile south-west of Langwathby (loc. 45: NY 56-37-); *P. tiliacea* occurred at Nentbury, Edenhall, and Melmerby village-green (loc. 44: NY 61-37-), and *Xanthoria elegans* was rare on a concrete post 1.5 miles south of Suddon (loc. 34: NY 838535). We were particularly struck by the absence of *Parmelia caperata* in all sites so far visited although it would have been common on similar trees in southern England where *P. tiliacea* would have been rarer.

Lowther Park, four miles south of Penrith (loc. 46: NY 52-24-), whose lichens were listed by the Rev. J. A. Martindale (Martindale, 1886-1890) had 59 corticolous species and we re-recorded almost all those found by Martindale – including *Lobaria amplissima* (on one *Fraxinus*), and *L. pulmonaria* (on five trees, three of which were *Ulmus*). Also of note were **Arthonia impolita* (sterile), *Arthopyrenia alba*, **Catillaria griffithii*, **Lepraria candelaris*, **Ochrolechia yasudae*, **Pertusaria coccodes*, **P. flavida*, **Ramalina farinacea* var. *hypoproteoctrarica*, **Schismatomma decolorans* and **Phycia farrea*. We did not, however, see *Anaptychia ciliaris* (reported as luxuriant by Martindale) *Normandina pulchella*, *Pachyphiale cornea*, or *Thelotrema lepadinum* here, but may have overlooked them in the heavy rain and poor light.

Near Keswick we first visited Castle Head Wood, a mature oakwood only 0.5 miles south from the town centre (loc. 47: NY 269226) which was very good but only an omen of ones to come. *Lobaria laetevirens*, *L. pulmonaria*, *Normandina pulchella*, *Pachyphiale cornea*, *Parmelia caperata* (the first locality in which we saw it on this excursion; it proved common in the Lake District), *P. crinita*, *P. perlata*, *P. prolixa* (rocks), *P. subrudecta*, *Peltigera horizontalis*, *Pertusaria flavida*, **P. hemisphaerica*, *P. leioplaca*, *Rinodina roboris*, and *Thelotrema lepadinum* were among the 61 species seen here. A single tree in the wall of the main road near Stable Hills, one mile south of Keswick (loc. 48: NY 271218) was most surprising with *Nephroma laevigatum*, *Lobaria amplissima*, *L. pulmonaria* and *Sticta limbata* on it. A wall nearby also had **Ramalina subfarinacea* var. *salazinicola* D. Hawksw. which is usually corticolous in the British Isles. At Calf Close Bay (loc. 49: NY 270215) *Lobaria amplissima* (with **Polychidium umhausense* forming tufts to 2.0 cm in height), *L. laetevirens*, and *L. pulmonaria* were frequent, and *Parmelia revoluta*, *Sticta fuliginosa* and *S. limbata* also occurred but were rare. Roadside trees 0.5 miles south of Grange, in Borrowdale (loc. 50: NY 252167) bore *Nephroma laevigatum* (fertile and abundant), and *Pannaria pityrea*.

The bryologically most interesting woods in this area, the Longthwaite and Johnny's Woods (loc. 52: NY 24/5-14-) were rather poor in the total numbers of corticolous lichens, although the final list from all habitats was 106 species. Included in this were *Arthonia cinnabarina*, *Arthopyrenia cinereopruinosa*, **Cetrelia cetrarioides*, (Duby) Culb. et Culb. (= *Parmelia cetrarioides*), **Haematomma elatinum*, **Lecidea cinnabarina*, *Normandina pulchella*, *Parmelia laevigata* (which was often dominant), *Parmeliopsis hyperopta*, *Pannaria pityrea*, *Porina chlorotica* var. *carpineae*, *Peltigera horizontalis*, *Stenocybe pullatula*, *S. septata*, *Sphaerophorus fragilis*, *S. globosus*, and *Tomasellia gelatinosa*. The woods to the south of Seatoller village (loc. 53: NY 24-13-) were rather similar but still poorer in species numbers. On the trees here a characteristic, probably undescribed, community occurs in this, probably the wettest woodland area in England (mean rainfall c. 150 in. p.a.) which is characterised by the codominance of *Parmelia laevigata* and *P. taylorensis*, with *Ochrolechia tartarea* (fertile) and *Mycoblastus sanguinarius* also common. Other 'atlantic' species not encountered previously on this excursion but seen here were *Parmeliella corallinoides* and *Sticta sylvatica*. Particularly interesting was the absence of *Lobaria* species and *Pachyphiale cornea* in these two woods (locs. 52 and 53) which would have been expected here if they were species as strongly 'atlantic' as some authors have suggested.

Brandlehow Park, on the north-west side of Derwentwater (loc. 56: NY 24/5-20-), though fairly poor in total numbers of species, had *Mycoblastus sanguinarius* and **Ochrolechia inversa* on birch trees by the lake shore. The *Ochrolechia* is of especial

interest as this is a highly atlantic species known in Wales and Ireland (Laundon, 1963) but only once collected in England, at Higher Piles Copse, South Devonshire, in 1969 (Hawksworth and Richardson, 1970). **Lecidea cinnabarina*, *Normandina pulchella*, *Ochrolechia tartarea*, *Parmelia revoluta*, and *Thelotrema lepadinum* were also found here on trees. Manesty Park (loc. 57: NY 25-18-) was not investigated in detail but roadside trees had *Parmelia caperata* which was also seen near Swinside (loc. 55: NY 246217) and at Brandlehow. The Keskadale oak woods (loc. 58: NY 20-18-) were rather uninteresting except in their upper parts where **Alectoria chalybeiformis* occurred on the horizontal branches of one ancient oak, and **Usnea fragiliscens* was frequent. The saxicolous flora of the crags immediately above the wood included *Bacidia citrinella*, *Lecidea dicksonii*, **Lepraria neglecta*, and *Cornicularia muricata*.

Scales Wood, Buttermere (loc. 59: 16/7-16-), also a site famous for its bryophytes, had 72 species of lichens, including those on trees and walls by the lake and Buttermere village. Among the latter were **Bacidia affinis*, **Candelariella aurella*, **C. xanthostigma*, *Lecidea berengeriana*, **Parmelia elegantula*, *Protoblastenia rupestris*, *Rhizocarpon obscuratum* var. *reductum* and *R. petraeum*. Near Brackenthwaite, at the north end of Crummock Water (loc. 60: NY 15-21-) a group of roadside trees had *Xanthorion* developed and in this community *Sticta limbata* (generally thought of as a nitrophobous species), *Parmelia caperata*, *P. perlata*, **P. exasperatula* and *Physcia pulverulenta* occurred.

In Great Wood, 1.25 miles south of Keswick (loc. 61: NY 270215) the best *Lobaria* communities we had seen anywhere in the British Isles or Brittany were discovered. *Lobaria amplissima*, *L. laetevirens* and *L. pulmonaria* were all common and dominant on *Ulmus glabra* and *Quercus*, forming sheets extending from the base often continuously to at least 35 metres up the trunks. This site was of exceptional interest for the trees themselves, though fine mature specimens, were not ancient ones, and were obviously regenerate rather than relic, yet the lichens found were those considered as typical of 'relic' forest in other parts of England. It seems probable that these species have been able to spread from older trees which have since disappeared, and develop communities similar to those which must once have been widespread in the British Isles. The occurrence of *L. pulmonaria* has been documented last century in all English counties except Norfolk, Huntingdonshire, Northamptonshire, Middlesex, Hertfordshire, and Staffordshire, which suggests that it was once generally distributed throughout England, and it appears still to be widely distributed in Continental Europe. The finding of *Lobaria* species in open situations in areas of relatively low rainfall in parklands in south-east England, north-west Herefordshire, south Northumberland (loc. 26) and Westmorland (loc. 46), together with our observations of their distribution in the Borowdale and Keswick areas (where they avoid the areas of highest rainfall), together with the evidence of their European and former British distributions, makes it clear that *L. amplissima*, *L. laetevirens* and *L. pulmonaria* are indicators of ancient forest rather than of 'atlantic' habitats. Truly atlantic species such as *Pannaria pityrea*, *P. rubiginosa*, *Parmelia taylorensis*, *P. laevigata*, and *Sticta sylvatica* always appear to be very rare or absent in localities where *Lobaria* is optimally developed. *Pachyphiale cornea*, *Haematomma elatinum*, *Lecidea cinnabarina*, and *Thelotrema lepadinum*, on the other hand, are probably similar to these three *Lobaria* species in indicating relics of ancient forest. Other interesting taxa noted at Great Wood, which had 77 corticolous lichens, were **Arthonia spadicea*, *Buellia disciformis*, **Catillaria sphaeroides*, **Cetrelia cetraroides*, *Dimerella diluta*, **Haematomma elatinum*, **Lepraria candelaris*, **Lecidea cinnabarina*, *Pachyphiale cornea*, **Parmelia crinita*, **Pertusaria flavida*, **P. hemisphaerica*, **Thelopsis rubella*, *Thelotrema lepadinum*, *Stenocybe septata*, *Sticta sylvatica*, *S. limbata*, and *S. fuliginosa*. *Thelopsis rubella* is of special interest; thought to be confined to the west Scottish Highlands and south-west Ireland, it has recently been discovered by one of us (F.R.) in Herefordshire, the New Forest, Devon and Sussex, and this new locality helps to bridge the disjunction in its known distribution.

Trees in Keswick Old Churchyard (loc. 66: NY 258242) were surprisingly rich in species for trees within a town and had 17 including *Parmelia perlata*, *P. tiliacea*, *P. subrudecta*, **Pertusaria flavida*, **Physcia farrea*, and *Buellia alboatra*. **Candelariella aurella* was also present on calcareous gravestones. This suggests that in areas of low 'background' air pollution, small towns with little industry like Keswick have little effect on the lichen flora of trees away from main roads.

The Aira Force area, near Ullswater (loc. 62: NY 398205 and loc. 63: NY 401205) yielded the *Lobaria* once more in the sheltered ravine below the lower falls. Here it was present on three oaks but much poorer in species than Great Wood (loc. 61) containing only *Lobaria pulmonaria*, *L. laetevirens*, *Normandina pulchella*, *Catillaria atropurpurea*, **Haematomma elatinum*, *Peltigera horizontalis*, and *Sticta limbata*. **Rhizocarpon riparium* subsp. *lindsayanum* (Räs.) Thoms. (= *R. lindsayanum*) occurred with *R. geographicum* subsp. *geographicum* and subsp. *prospectans* (Räs.) D. Hawksw. et Sowt. (= *R. tinei* subsp. *prospectans* (Räs.) Runem.) on a volcanic schist wall here.

The last site visited during this excursion was Levens Park, near Kendal (loc. 65: NY 49-/50-85-) which was studied last century by Martindale (1886-1890). The absence of the *Lobaria*'s which Martindale recorded, and of any species of *Usnea*, indicated that this site was at the margin of air pollution effects from the south Lancashire-Preston conurbation. 72 species were found here of which 53 were corticolous. **Caloplaca herbidella* (Arn.) Magn. was the most interesting find and was abundant on a single *Quercus*; this species is known in the British Isles from only one other locality (Wiltshire: Savernake Forest, 1968, F. Rose, det. P. W. James) where it occupies a similar habitat in open park-like forest on mature oaks.

Bacidia phacodes, **B. rubella*, *Parmelia caperata*, *P. tiliacea*, **Pertusaria hemisphaerica*, *Rinodina roboris*, and *Schismatomma decolorans* were also present on trees; and *Arthopyrenia conoidea*, *Caloplaca cirrochroa*, *Catillaria lenticularis*, *Gyalecta jenensis*, and *Petractis clausa* on limestone. It was noted that the south sides of oak trees on the higher, more exposed, ground here bore a dense cover of *Lecanora conizaeoides* and little else, while the north sides of these trees (facing away from industrial Lancashire) had more 'normal' *Parmelia*-*Evernia* dominated communities.

Although several sites from which *Lobaria scrobiculata* has been reported in the past, and in which other *Lobaria* species are still extant, were visited, in none was it refound. This species appears to have become almost extinct in England this century but the reasons for this are by no means clear. Many of the species noted by us in the Lake District seem to have rather similar distributions there now as when they were studied by Winch (1833). Winch (1833) noted, for example, that *L. pulmonaria* was '... in every wood near Keswick ...' - an apt summary of our findings on its distribution in Cumberland today, 136 years later.

It is, however, clear that far more studies are needed in the north of England counties before they can be considered at least as well known as those of southern England; that the absence of many species from the Midland region today is probably a result of anthropogenic rather than phytogeographical factors; and that too much emphasis should not be placed on seemingly disjunct distributions between southern England and central Scotland before this area (North England) has been investigated properly.

We are indebted to Mr. P. W. James and Mr. J. R. Laundon for checking the determinations of a number of critical specimens; to Dr. O. L. Gilbert for his kind hospitality to us while in Northumberland; and to the Nature Conservancy for financial support.

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FIELD NOTES

The Oak Fern and a Rare Grass near Sheffield

Whilst engaged upon recording in the Loxley Valley, for a proposed Sheffield Flora, I was pleased to come across the Oak Fern (*Gymnocarpium dryopteris*). The find was particularly pleasing as it was confirmation of a very old record.

This fern was first recorded for the locality—Little Matlock, near Malin Bridge, less than three miles from the centre of Sheffield—by Jonathan Salt, an early Sheffield botanist who was active towards the end of the 18th century. A hundred years later Amos Carr, an assiduous recorder, confirmed that the Oak Fern was still at Little Matlock—known as Cliff Rocher in those days—and his record was included in Lees' *Flora of West Yorkshire* (1888). Later, Snelgrove, writing in the *British Association Handbook* (1910) considered the fern to be extinct in the locality and no evidence to the contrary has been forthcoming until the present re-discovery. It was found growing on a small exposure of rock, under bushes in two places about a yard apart and was in a healthy condition, about 200 fronds being counted. The locality, though close to Sheffield, has, because of its rough and craggy nature, been little disturbed since Salt's day.

Beneath the quarry face, close to the Oak Fern site, the grass *Festuca altissima* is abundant, growing on the loose scree. This is a rare grass in the district and the only other locality known hereabouts is 25 miles from Sheffield, at Matlock in Derbyshire. This grass, recorded by Martin Spray of the Sorby Natural History Society in 1967, must have been overlooked by the early botanists, Salt and Carr; or could it have come in since their time?

CHAS. B. WAITE, *Sorby Natural History Society*.

Early Nesting by a pair of Tawny Owls.

On Shrove Tuesday, 10th February, 1970, Corporation workmen had to lop a branch from a tree in The Valley, Scarborough, because it was deemed to be unsafe. When the branch fell to the ground it shattered into several pieces being completely rotten, and the workmen found inside one of the pieces two Tawny Owl (*Strix aluco*) chicks, still warm, but dead presumably as a result of their fall inside the branch.

The bodies were buried by the workmen but were later dug up again when C. I. Massey, Curator of Woodend Museum, Scarborough, heard of the incident. The chicks are deemed to have been some 8 - 10 days old at the time they died, for the brown fleckings were already showing through the white down and the primary quills had just burst to show the tips of the wing feathers.

On this assumption and with a minimum of 28 days for incubation (as quoted by *The Handbook of British Birds*) the eggs must have been laid during the first week of January. All authorities referred to quote mid to late March as the starting time for nesting by the Tawny Owl. Eggs during the early part of January are therefore exceptional.

The young birds have been preserved by J. R. Mather, who found them to be a ♂ and a ♀, and in good physical condition with plenty of fat developed. They had been fed, in part at least, on Starling (*Sturnus vulgaris*), for a tarsus of this species was found in the crop of one youngster. The workmen also mentioned seeing remains of Starling in the nest hole.

A. J. WALLIS

Wings in the Meadow by Jo Brewer. Pp. 187 with numerous black and white sketches. J. M. Dent & Sons Ltd. 1970. 35/—.

The author describes this book as a novel but to call it fiction is misleading since the whole story is made up of facts drawn from the author's own experience in the observation of nature and from an extensive scientific bibliography. Expressed in another way it is a monograph on the Monarch Butterfly of America written as a story about a single individual insect. Its life-cycle, its enemies and its extraordinary migratory habits are all described in a most readable little book.

Britons may find the surroundings in which the butterflies live somewhat unfamiliar as the popular names of the birds, flowers and trees of New England convey very little to anyone unfamiliar with the area. Nevertheless a reader of almost any age with an interest in any form of nature will enjoy reading the story and few will not learn from it.

FARMING & THE FLORA

C. M. ROB

Presidential Address to the Yorkshire Naturalists' Union, Sheffield, 6th December, 1969

Ever since Neolithic people came to Great Britain until the present day, farmers have been changing the countryside, with the result that both the flora and fauna are very different to what they must have been when the first farmers arrived. Present day agriculture has become a very complicated and scientific method of making a living. The change from deer-antler picks to modern farm implements has taken a long time, round about four thousand years. As I am not in any way qualified to tell all the story all I can hope to do is to try and point out some of the ways in which the work of the farmer has changed the flora in the fifty years I have lived on the same lowland farm in the Vale of Mowbray.

During this time the whole pattern of agricultural practice has changed at a rate almost beyond belief and in ways that my farmer grandfather would find difficult to comprehend and understand. At this point I want to make it quite clear that my remarks refer to a very small area of the North Riding and are not intended to apply to other districts and other types of soils, even in Yorkshire.

At the present time there seems to be a fairly general impression that the two things that change the flora are, either the ever-increasing use of chemical sprays for weed control and as pesticides, or the uprooting and removal of the miles of hedgerow which has been happening in recent years. This is an over simplification of the problem for, important as they are, sprays and hedges are only two of a number of factors affecting plant life on any farm, from the hill-farm of the higher dales to the big arable farm of the lowlands. Many of these factors have been active for much longer than fifty years, whilst others – for instance the use of chemicals on the land – are still in their infancy. It is impossible therefore under modern conditions to farm efficiently without using chemicals. What we must strive for is to permit the use only of those which are the least harmful to life, wild and domestic; the ones safest for both man and beast.

Some of the other farming factors are drainage, ploughing out of grassland, changed methods of grassland management, cleaner seed and mechanisation, all of which overlap and make a very complex pattern. Drainage is no new method of land improvement. Much of our farmland was drained more than a hundred years ago and many of the present-day drainage schemes are necessary because the older drains and ditches have either been lost and forgotten, or are no longer efficient owing to neglect during the lean years between the two world wars and shortage of skilled labour since 1945.

Much drainage took place at the time of the Enclosure Acts of the late seventeen and early eighteen hundreds, when open fields and a considerable amount of lowland heath was divided and fenced and the village cow-pastures fenced and often ploughed. Many drains followed the lines of the hedges planted at those times, generally in the form of a ditch. When these hedges are taken out, the ditches, so necessary for draining the land, are filled in, resulting in some extreme cases in water-logged fields. Small field ponds were so often an important part of the drainage of an area and as these have today almost disappeared, the drainage has suffered; a number of wet-loving plants have become increasingly rare, whilst toads and frogs and other animals get scarcer every year.

Ploughing up the old grass pastures has become all too popular. This practice is less damaging in the higher dales, where most fields have some part, either too steep or too rocky to be worked. These unploughed bits are a refuge for plants and may serve as a reservoir for recolonisation of the reseeded ground. In the lowland districts no such refuge exists and, although some grassland has been reseeded, much of the old permanent pasture is now under arable crops, or a short term ley. Pastures once necessary for farm horses and meadows which provided their hay, have become redundant and there are many farms where no stock is kept, resulting in an almost entirely arable holding.

Many of the characteristic plants of old grassland have gone because of this ploughing, which has been encouraged by Government grants. *Colchicum autumnale*, *Orchis morio* and *Orchis ustulata* are becoming more and more uncommon and there are a number of other species which have suffered from this particular method of agriculture. Up to about the first war, fields which were laid to grass were either sown

with sweepings from the hayloft or haybarn floor, or simply left to "tumble down" over the years. Both these methods brought many plants other than grass, but now a reseeded field is sown with a mixture of varieties of grasses carefully chosen and scientifically blended. Grassland of all types is managed in ways very different from those of our forefathers, although the practice of taking the plough around the farm is nothing new: they were doing this years before such things as ploughing-out grants were thought of.

Today grassland is manured and grazed to get maximum returns and if the land becomes weed infested, it is ploughed out and sown down again; if not, it is all too often reploughed when it is again eligible for a grant. Once familiar farm weeds no longer come in with the new seed; seed-dressing and clearing has eradicated the not-wanted weed seed and we no longer find fields blue with Cornflowers or pink with Corncockles. The last time I saw *Agrostemma githago* in corn was during the last war, in a ploughed up part of Hornby Park, which had been sown with lease-lend seed and was full of the plant, more Corncockle than corn.

Clover Dodder (*Cuscuta trifolii*) and Small Broomrape (*Orobanche minor*), were not uncommon about a hundred years ago. Now they have gone completely, although the Broomrape turned up on the roadside verge of the A.1. three or four years ago. Many aliens and casuals appeared in the once popular white clover leys, plants that are no longer seen, partly because of the cleaner seed, but mainly because this particular crop has become so expensive to grow it is no longer economic. Two plants found in this crop, *Alyssum alyssoides* and *Filago germanica* (the last named was very common) have not been seen for over thirty years.

Perhaps the most important factor affecting the flora is the change over from horse to machine power. Machines came to my district during the first war, first the steam tackle, two giant traction engines, one at either side of the field with a plough or cultivator on a cable between them. Very soon after the steam tackle the tractors followed and ever since then more and bigger machines keep on arriving, until only the experts know what many of the more exotic ones are used for. The old reaper was replaced by the self binder, horse-drawn at first, but later the tractors took over. Today most of the corn crop is gathered in by the combine harvester, which cuts and thrashes the crop as it goes round, the chaff, weed seed and straw are left in the field and only the thrashed grain carried into store. Where the straw is needed it is baled and led away, the whole process taking a matter of days in good weather; a much shorter time than the old way of leaving the stooks of corn in the field to dry. If not wanted, the straw is set on fire. Burning the stubble does surprisingly little harm to plant life, but is a real hazard for birds and other animals, though the birds seem to enjoy the roasted grain.

One result of mechanisation is that fields are cultivated a few days after being cleared and we are thus losing a number of once common plants including Corn-nint, *Mentha arvensis*. As new and bigger machines take over, the whole year's work is speeded up. Machines are necessary partly because of the shortage and high cost of labour and to combat weather and other hazards, but many are far too expensive for the small farmer and are provided by contractors.

The flora of any arable field depends on the crop it is carrying. In the past farms were worked on a fairly rigid crop rotation. Chemical farming has made it both possible and paying to grow several crops of the same sort, often barley, for several years and this has made a considerable change in the weed flora of many farms. One of these changes is the alarming increase in Wild Oats, *Avena fatua*. Once a very rare plant in the Thirsk district, it is now a very troublesome weed, whilst *Agropyron repens*, known to the local farmers as "wickets", has also become much more frequent and the present farming techniques do little to control either of these. It may be that in time we shall have to return to following as part of the rotation to clear the land, as was done in Anglo-Saxon times.

Spraying has certainly had a very marked effect on the flora, though its impact on the fauna is more disturbing. Ordinary weed-killers, if used correctly, do less damage than was first feared and fortunately so far, we see little use of pesticides in the North Riding. Spraying of river banks and waterways should be discouraged by everyone because of its damaging effects, not only on the plants but on the fish population. The sprays that should be controlled and used with care are those used to kill off potato tops before lifting. Some of these are of the Paraquat group or some caustic substances. Both are dangerous if used on a windy day. Wind drift is a very big danger in all types of spraying and the use of aircraft for this purpose is far too risky in a small country like Britain.

The farmer's animals have always played an important part in the flora of any farm. One way the animal is changing the land is that as stock goes, so do organic manures. Concentrated fertilisers are very effective, but they encourage one of the biggest dangers arising from modern agriculture – soil erosion – and burning the straw removes valuable humus-forming material. Fields are blowing in the high winds of spring in a way which should not be ignored. Like many bad habits, soil erosion is easier to cure in its early stages. Hedge removal encourages soil erosion and it may well be that in the not distant future farmers will have to plant shelter belts to combat soil blow. Mixed animal and arable farming with good shelter belts does much to prevent this trouble. Many of the hedges removed since the first war had ceased to be of any use as fences; to keep hedges alive and efficient is expensive and needs skills lost in this mechanised age. The removal of some hedges is no real loss to either flora or fauna, but the old mixed hedge – often along a country lane – is a really fine reservoir for a relict woodland flora and should be preserved, even if the cost is high. Shelter belts could be a very real asset, providing they are made up of the right species and managed in a proper manner.

We see that there are many other reasons for the changes in the flora of any farm than spraying and removing hedges. I have not touched on the many species of plants introduced by agriculture in the past, nor have I given in any way a full account of the aspects on which I have touched, but I hope I have shown that the story of the farmer and the flora is not quite that given in the poem by John Betjeman which starts:

“We spray the fields and scatter
the poison on the ground
so that no wicked wild flowers
upon our farms are found”.

As farming changes so it changes the flora, but far more changes have come about from the activities of man other than the British Farmer. Many farmers, especially the older, more experienced ones, are becoming interested in conservation and it is up to all naturalists to foster and encourage this interest. We must use tact and courtesy when dealing with the men who work on the land; ask permission to enter fields and respect the land and the stock. A dairy herd is nearly as highly strung as a prima donna and if upset, the fall in milk yield means a big loss to the farmer concerned.

I have never been refused permission to enter land and a spirit of goodwill, general trust and undersanding, will do more for wild life conservation than most modern ways of protesting.

MIELICHHOFERIA AND COSCINODON IN CLEVELAND; A CHALLENGE

C. COCKRAM

In the April 1968 issue of the *Naturalist*, Miss Dalby reported on the refinding of *Mielichhoferia elongata* on Ingleby Moor, growing with *Coscinodon cribrosus*. The main object of the present paper is to review the literature on *Mielichhoferia* in Britain in order to try to assess the probability that it could be found elsewhere on the Cleveland escarpment and to encourage other amateur bryologists to make a diligent search.

It was not until I read Gams' paper (3) on Moss Societies that I realised the significance of the occurrence of two mosses, very rare in Britain, growing together on the Cleveland alum shale. Gams says that in the mountains of Eurasia, where *M. nitida* grows together with *Grimmia atrata* and *Coscinodon cribrosus*, the essential habitat character seems not to be the presence of copper or iron but of sulphuric acid. Now the other station for *Mielichhoferia* in Britain is in Corrie Kander, south of Braemar where it grows with *Grimmia atrata* on iron and sulphate-bearing rock(7). So! we complete Gams' trio.

Including Mudd's discovery of *Mielichhoferia* in 1862, it has been found five times at the Ingleby station; on the last occasion (1967) it was found in two gullies very close together, in one with *Coscinodon*. It seems likely and not unnatural that so much interest has been shown in Mudd's discovery that bryologists' attentions have been directed to this one spot to the exclusion of the rest of Cleveland. Several ecological problems are presented to us. (A) What are the physical conditions and the chemical nature of the substrates where they grow and can we match these conditions elsewhere in the area? (B) How did they come to Cleveland? (C) Did they come together or was there an interval of time?

All along the N. Cleveland escarpment, from Osmotherly to the coast, there is ample evidence of overlying Lias (the alum shales). These can be seen in the old alum workings. These shales are soft, foliated rocks easily broken down by water and frost into thin plates and fine clay. They contain ironstone, calcium sulphate, much finely divided pyrites (FeS_2) and some copper sulphide. Now pyrites is slowly converted to iron sulphate by oxidation under moist conditions. Indeed, the success of alum making in Cleveland depended on the presence of much pyrites in shale to provide the sulphate radical for the conversion of the clay into aluminium sulphate in the alum burning process. Interesting accounts of the alum industry are given in Kendall and Wroot (4) and Clow (1). Pyrites and copper sulphide are insoluble in water but their sulphates are readily leached out by water. The concentration of soil sulphates is in part maintained by the slow oxidation of the sulphides and, under suitable conditions, by percolation of water solutions from the surrounding areas of shale. This is the clue to the kind of habitat favoured by *Mielichhoferia*.

C. D. Piggott (5) gives a detailed account of the site on which *Mielichhoferia* is found at Ingleby. He writes "The green velvety cushions are plentiful over an extensive area on an exceedingly steep (38°) sloping outcrop of Liassic shale at 900 ft. but are precisely restricted to that part of the slope which faces N to NE ($\text{N}10^\circ\text{W}$ – $\text{N}30^\circ\text{E}$). The slope, aspect and concavity of the hillside are such that direct sun can rarely, if ever, reach the plant. Although the slope consists of a very unstable shallow scree of hard, small flakes of shale, the numerous moss cushions are always attached to small outcrops of solid rock, which appear to keep moist not only because of seepage but also because evaporation is reduced by the surface layer of flakes and the sunless position. In the area where *Mielichhoferia* is plentiful no other plants are present and this may be attributed to the exceptional nature of the weathered shale which forms a dark gritty clay under the moss". He also gives an analysis of the shale debris which is strongly acid; it contains sulphates and copper. Now this is a restrictive specification for habitat but I am sure that it can be matched elsewhere in the district. Evidently some variation is permissible; at the Corrie Kander site *Mielichhoferia* grows under similar conditions of moisture, shade, and sulphate content, but it grows on boulders and cliffs of rock which are physically quite different. The rock is a schist which is foliated and porous but it is not subject to the intensive shattering by rain and frost which alum shale suffers. I think that shale scree over porous sandstone blocks, which occurs in Cleveland, might prove equally suitable for this moss. It is my opinion that *Coscinodon* is more tolerant of light and drought; it has been found in this country on walls and on the Continent it grows in full sunlight. However, a bare dark shale is ideal for spotting it. I think that *Coscinodon* may be rare because it suffers from anonymity, i.e. no fruit and no special feature to catch the eye. By contrast, *Grimmia atrata* is not rare where there is suitable rock. It ranges from Scotland to Hobcarton Cragg in Cumberland and to several places in Wales, and it is often in fruit.

The carriers of *Mielichhoferia* and *Coscinodon* to Cleveland are likely to be:

- (i) Wind-borne spores or propagules; the prevailing winds are NE and SW. Both Cleveland and Corrie Kander are on the track of NE winds from Scandinavia where all three mosses grow.
- (ii) Birds; the area is visited by many birds during migrations to and from the Continent.
- (iii) Sheep; how they love to tuck their backs into moorland banks for shelter. It is known that Spanish Merino sheep were imported into the north of Scotland in the early 1800's for breeding to improve the quality of our wool (6). I have not been able to ascertain that there were imports of foreign sheep directly into Cleveland. In this connection, it may be noted that *Orthodontium lineare*, a native of the Southern Hemisphere, was found in West Yorkshire in 1920. In the NE it is now widespread and abundant. What is more likely than that it should have been imported with wool from Australia or New Zealand and that it has spread in a NE direction. It is scarce in Scotland and Ireland and I believe that it has appeared only recently in France. Have we missed the opportunity to learn more about 'speed and pattern of dispersal of mosses'?
- (iv) Humans; P. D. Coker (2) thinks that *Mielichhoferia* has certainly been introduced in Cleveland as a result of medieval alum shale extraction. Certainly considerable numbers of foreign alum workers came to Cleveland, starting with the legendary smuggling out of Italy, in a cask, of a Papal alum worker to assist in starting the alum works at Guisborough. The dates for the main

influx are uncertain but the operative dates lie between 1600 to 1850. It is possible that the shale mining operations produced suitable habitats for these mosses but in the main the relics of alum extraction consist of large mounds of fine shale which are continuously eroded by wind and water and are unsuitable for plant life.

Are these mosses relics of the Ice Age? Geologists tell us that a lake was formed in the angle of the hills about Ingleby Greenhow. This was filled with ice melt water and it overflowed into Bilsdale by a notch at Chop Gate. So, presumably the site of our mosses was drowned to a depth of some 300 feet. Since then the escarpment face has been eroded and pushed back, so it seems very unlikely that any of the pre-glacial vegetation could have survived.

Mielichhoferia and *Coscinodon* are shy to fruit in Britain and once established, spreading is probably very localised. Of the methods of transport to the area which have been considered here, wind-borne spores would provide the widest distribution, the greatest quantity of spores and the best chances of finding these mosses elsewhere. Birds, sheep or humans as agents are likely to have resulted in a very restricted distribution. If we take the evidence available at face value, i.e. that the two mosses arrived at different times, the most likely agent was wind and the chances of finding them elsewhere seem good. It is also necessary to assume that the Ingleby site is not unique in character. If, however, we feel that there is a strong case that *Coscinodon* was missed before 1967, then we still have no definite proof that they arrived together but none of the possible agents can be ruled out and the probability that they might be found elsewhere is reduced. I think that the odds are in favour of having a try. Success could provide useful clues to how rare mosses establish themselves. If we fail, we might find something equally interesting; perhaps the third of the trio, *Grimmia atrata*? We know the kind of places to look for but how easy is it to spot these mosses? I quote Miss Dalby's comments to me "*Mielichhoferia* is striking, being a most brilliant light-green growing on dark shale, you just know there is something new. *Coscinodon* is not so easy, it was not in fruit, it could easily be missed". The only advice I can offer after seeing the specimen of *Coscinodon* is to look closely at anything green growing on bare shale even if it appears to be a small liverwort.

We seem to know very little about the variations in composition of alum shales and their effect on plant life. The old alum makers chose their sites mainly on economic considerations, good wind for the burning operation, ease of mining and the disposal of the large volume of waste. The workings are generally close to the north face of the escarpment and do not provide a clue to the nature of the shales elsewhere. In moving around the area it is evident that the alum shales vary in composition, several different kinds may be seen even within a small area. In many places it can be seen that they run out into mixtures of shale and sand, sometimes into pure, laminated sandstones. It is not too difficult to distinguish the much contaminated shales, which are lighter in colour and laminated into thicker and harder plates. The kind of alum shale we are looking for is softer and dark grey. It breaks down into thin, small platelets which can be seen under a glass to be further laminated and are easily split with a knife. They are often associated with the ultimate product of weathering, a fine, gritty clay which is retentive of water and salts. It may be of some significance that this clay never seems to achieve the plasticity of ordinary soil clays. Perhaps the changes brought about by the extreme pressures responsible for the formation of shales are not completely reversible. It is a matter for speculation whether these regenerated clays are capable of the ion exchange reactions with salt solutions which are characteristic of clay soils.

The main impurities which concern us are the basic compounds; ironstone, mainly iron carbonate with some oxide, and calcium carbonate; they can neutralise the free acid produced from pyrites. The ironstones occur in abundance all over the area. Evidence for calcium carbonate is seen in fossil shells and the efflorescence of calcium sulphate on the face of shale cliffs. The content of pyrites also varies – it is said that the dark colour of shale is due to finely divided pyrites.

When pyrites in moist shale are oxidised by sulphur bacteria (*Thiobacillus thiooxidans*) one unit of FeS_2 yields one unit of SO_4 as ferrous sulphate and one unit of SO_4 as sulphuric acid. More or less of this acid is neutralised by the basic constituents of the shale. Piggott's analysis of the water extract from the shale at the Ingleby site showed a pH of 3; such a high acidity must mean that the shale contains free acid and that the original shale was relatively free from basic impurities. The normal run of shales have a constant pH of about 4 to 5 which is the pH of ferrous sulphate

solution (to be more accurate of a mixture of ferrous and ferric because in the absence of free acid ferrous sulphate is oxidised to ferric). This constancy of pH in ordinary shales, of varying composition, may seem strange but if we consider the analogous situation, the titration with sulphuric acid of a weak suspension in water of iron carbonate, we can see why this should be so. The first additions of acid produce ferrous sulphate and the solution assumes the pH of that salt. Up to the point of complete neutralisation of the base the pH remains constant, but when free acid appears the pH falls extremely rapidly. pH determinations are useful for spotting acid shales of the type found at the Ingleby site. They can be done in the field by simple soil pH techniques. This is the shale we are most interested in finding elsewhere. pH determinations as a means of following variations in the composition of "neutral" shales are useless and if we are interested in this it is necessary to resort to a laborious and tricky series of analyses.

A considerable volume of work has been done by plant physiologists on the effects of iron compounds in nutrient solutions, in particular on the incidence of iron chlorosis. One general conclusion which seems to be accepted is that the effects of iron compounds are related to the mobility of the iron within a plant, i.e. the iron must be able to move freely to the seat of active chlorophyll production. Low pH leads to high mobility but what one plant can stand may be toxic to another. Now *Mielichhoferia* flourishes at the Ingleby site with shale of very high acidity. The *Coscinodon* is a very poor specimen compared with plants found on the Continent where it grows well and fruits freely. But the Continental plant grows on a different kind of pyritic rock, often in situations which are subject to more leaching and strong sunlight. It would appear that the Ingleby plant is on its limit of acid tolerance. It would be interesting to know more about the acidity of Continental rock and of the *Mielichhoferia* site at Corrie Kander. Is it possible that the insistence of this moss on constant moisture and no sun is related to the high concentration of sulphuric acid solution which would arise if the shale dried out?

In concluding, I would like to express my thanks to Mr. G. A. Shaw for his interest and encouragement to write this paper and to Miss M. Dalby for her patience in answering many questions on the Ingleby Greenhow site and for making it possible for me to consult the B.B.S. papers quoted.

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Africa's Bane; The Tsetse Fly by T. A. M. Nash. Pp. 224 with 8 photographic plates and 10 figures. Collins, 1969. 42/-.

Sleeping sickness has been responsible for the death of tens of thousands of Africans and the disease known as "nagana" in African domestic animals has been even more devastating. At the beginning of this century it was discovered that species of blood sucking tsetse flies were responsible for the transmission of these diseases and this book tells a fascinating story of subsequent entomological, veterinary and medical research. It is packed with scientific information but it is never dull.

I found the chapters dealing with the biology of the various species of tsetse flies particularly interesting and especially the techniques used in the field studies. These are indeed the parts which will be of special interest to entomologists but the book can be recommended as general reading for anyone with a concern for natural history or African affairs.

AN ANALYSIS OF 58 IMMATURE TERNS
STERNA HIRUNDO L. and *S. MACRURA* NAUM
 FROM FILEY, YORKSHIRE

JOHN R. MATHER

This paper examines the information made available by the illegal shooting of at least 55 Common Terns (*Sterna hirundo* L.) and three Arctic Terns (*Sterna macrura* Naum.) at Filey Brigg, Yorkshire. At approximately 1100 hrs. on 28th October 1967, R. H. Appleby of Scarborough discovered 57 bodies floating in the sea in a close bunch amongst the rocks near the end of the Brigg. A wounded bird was nearby and 11 others were flying around the area. After examining the dead birds Appleby concluded they had been shot on the rocks earlier that morning and were being picked up by the rising tide. It was learned later that a youth with a shotgun had been seen walking off the Brigg earlier the same morning. I received 38 of the birds including the wounded one later the same day and on examination it was apparent that shooting had been the cause of death as each bird had one or more patches of bloodstain on the wet plumage, each patch overlying a small puncture hole in the skin. The wounded bird had similar injuries and died next day.

No shot was discovered whilst the first batch was being skinned although there was much internal damage and bleeding and one bird had a smashed upper mandible. Some weeks later, following a request from the Filey police for positive evidence of shooting (in the event of their ultimately bringing a case) I arranged for the last 11 corpses, which had been in deep freeze, to be X-rayed. Surprisingly no shot was revealed and only one bird showed any bone damage in the form of a broken furculum. Because of the limited time available when the first batch was being skinned, they were not minutely examined for shot and although from the evidence some must have passed right through, some must surely have lodged.

It is difficult to imagine the circumstances of the incident in the light of available evidence. Certainly birds had not been picked off singly whilst flying. Apart from causing much more damage this would have attracted too much attention from the locals. Had they been subjected to one or two barrels of a 12-bore shotgun as they rested in typical tern fashion, tightly bunched on some rocks? This would account for the fact that each bird showed only slight and fairly consistent damage, especially if the range was such that the spread was wide.

Preparation and examination of material

Of the 58 bodies involved, 55 were Common Terns and three were Arctic Terns. I initially received 38 of these of which 16 *S. hirundo* and three *S. macrura* were made into study skins and seven sets of paired wings of *S. hirundo* were prepared. The remaining 20 bodies of *S. hirundo* which had not been sent to me with the first batch because of mutilation by large gulls, *Larus* sp. and excessive soiling, had been taken back to Scarborough and disposed of on the beach. At my request Appleby recovered these early next morning and although the bodies had been badly picked by gulls and possibly a fox, he was able to salvage useful remains of 13 individuals.

Measurements were taken where possible and 50 sets of wing, 44 sets of bill and 47 sets of tarsus measurements were obtained. These included the three *S. macrura*. All the birds were internally examined to establish the sex but this was made difficult and sometimes impossible in some specimens because of shot damage. All the birds were in good physical condition and carried copious amounts of subdermal fat which in some specimens was pinkish, in contrast to the more normal creamy colour of that of the majority.

Date and flock size

Apart from a record under Common Tern of "many" being observed at Flamborough during a heavy storm on 19th November, 1895, (Nelson, 1907) large numbers of *Sternos* terns are very unusual any later than early October. Chislett (1952) was able to cite only the occurrence of one at Brough on 28th October, 1949 as the "latest record in recent years" and subsequent annual reports of the Yorkshire Naturalists' Union (1952-1966) do not record any larger numbers for that month. Up to 1966, the status of *S. hirundo* on the Yorkshire coast from October onwards would therefore seem to be:

Small numbers regularly up to mid October, usually only single birds thereafter to month end, with singles occasionally in November and sometimes December. The same applies to the Arctic Tern.

1967 was however an exception, and the tern flocks were late in passing down the east coast. At Spurn Bird Observatory heavy passage was observed, usually during the last two hours before dusk, from the 2nd to the 6th October, 1,000 to 1,750 terns passed south each evening with numbers decreasing to 800 by the 12th. At the end of the month birds were still passing south in numbers much higher than usual for the time of year:- 60 on the 24th, 55 on the 26th and 66 on the 28th, - the date of the incident under review. Three birds on the 31st October and two on the 11th November were the last recorded. None was specifically identified, all being recorded simply as Common/Arctic Terns.

These records are therefore of some importance and the Filey sample is interesting in its species composition.

Age and Plumage

All the 58 birds were immature in their first year.

- (a) **Common Tern.** There was much variation in plumage and birds ranged from one well-marked individual to the almost unmarked bird shown in *fig. 1*, the majority being like the bird in the centre. Very few were far advanced in the moult to first year plumage and these showed only a few clear grey feathers on the mantle. The differences in plumage illustrated are not entirely due to moult but are mainly individual variation and perhaps abrasion. The same general pattern on the scapulars and inner secondaries exists in all three specimens shown, but is much diluted in the upper bird. All the birds in the sample had pale whitish foreheads and variably streaked crowns merging into solid black on the hind crown and nape. Some individuals showed pale brownish feathers on the forehead and one bird had a completely gingerish-brown forehead and was generally more tinged with ginger on the mantle feathers and inner secondaries.



Three specimens of a batch of 55 immature Common Terns *S. hirundo* from Filey, Yorkshire, 28th October, 1967, showing individual variation in plumage. The centre bird is representative of the majority.

The rumps were pale grey and the fork in the tail was between 35 and 40 millimetres deep. In some birds the outer tail feathers were broken at the tip. The dark line on the inner web of the outer (second) primary was uniform in all specimens, broadening gradually along its whole length and terminating with the edge of the inner web 25 to 30 millimetres from the tip. All the birds showed well-defined dark carpal bars but these varied in density, some being dark greyish, others quite black.

- (b) **Arctic Tern.** Although only three specimens were available it is considered valid to describe the plumage and make comparisons with the sample of *S. hirundo*. All three were in juvenile plumage and showed the same individual variation as the *S. hirundo*, one bird having very pale subterminal bars on the mantle feathers and inner secondaries. The foreheads were white and the crowns identical with the *S. hirundo*. The rumps differed from *S. hirundo* in being pure white. The tail forks were exactly like the latter species. The dark line on the inner web of the outer (second) primary was uniform in the three specimens and differed from that in *S. hirundo* as illustrated in the *Handbook* Vol. V. p.34. The line was however broader than is there shown and not as suggested by the diagrams, so parallel with the shaft before it broadened sharply to join the edge of the inner web 15 millimetres from the tip. In two specimens the carpal bars were a much paler grey than the majority of the *S. hirundo* but the third was equally as dark.

Soft Parts: Colour and length

- (a) **Bills.** The three *S. macrura* were readily picked out from the remainder by the colour of their bills. These were black, tinged deep red at the base of the lower mandible. The *S. hirundo* without exception, but with slight individual variation, had bills of a paler brownish-black with at least the basal half of the lower mandible and half the commissural ridge of the upper mandible orange-red. Bill lengths along the culmen (tip to feathers) was measured with dividers to the nearest millimetre. All the three *S. macrura* had a bill length of 28 millimetres. A sample of 41 *S. hirundo* was measured consisting of 15 males, 15 females and 11 individuals whose sex could not be determined. The details are summarised below.

	Number examined	Mean	Standard Error of mean	Range
Males	15	31.80 mm.	0.509	28-36 mm.
Females	15	31.27 mm.	0.628	26-35 mm.
All birds	41	31.78 mm.	0.317	26-36 mm.

The mean bill length of the males is slightly higher than that of the females, but the difference is not significant. Anderson (1959) gives the mean of a sample of 61 adult *S. hirundo* from Denmark as 35.85 millimetres with a standard error of 0.217, a measurement some 4 mm. greater than that for the immature birds in the sample above. He found that whilst there was a significant difference between the mean bill length of male and female adult birds, the overlap of the distributions was so great (as it was in the Filey sample) that this character was of no value as a sexing criterion.

- (b) **Tarsus.** The legs and feet of two of the *S. macrura* were deep coral red, tinged brown on the outer sides and those of the other, a darker red tinged brown on the outer sides. Of the 26 individuals of *S. hirundo* examined for this character, 24 had legs and feet pale orange, those of the remaining two were flesh brown in one and pale orange brown in the other. There was no correlation between apparent age and leg colour, the two latter individuals being in the same plumage state as the majority. The tarsus lengths of the three *S. macrura* were 17, 17 and 16 millimetres and as was expected these were significantly shorter than any of the *S. hirundo*. 44 sets of measurements of the tarsus of the latter species were taken (no distinction between the sexes was made) which gave a mean of 20.77 millimetres (S.E. of mean = 0.141) and covered a range from 19 to 23 millimetres.

Wing Length Analysis

Wings were measured to the nearest millimetre using flattened chord and straightened leading edge. Those of the three *S. macrura* measured 236, 248 and 250 millimetres. Of the 47 specimens of *S. hirundo* whose wings were measured 15 were male, 17 were female and the remaining 15 of indeterminate sex. The measurements are summarised in the table below.

	Number examined	Mean	Standard error of mean	Range
Males	15	254.47 mm.	0.940	247-259 mm.
Females	17	258.29 mm.	1.742	245-277 mm.
All birds	47	257.04 mm.	0.877	245-277 mm.

The variance of the female sample is significantly greater than that of the male sample ($F = 3.886$, $P < 0.02$) and this is shown in the more extensive range of the wing lengths of the female birds. Further, the difference in mean wing length of the two sexes is significant ($P < 0.05$). Thus, females on average have a longer wing than males, but wing length is more variable, so that certain female wings can be shorter or longer than the shortest or longest male wings. This "nesting" of the male wing length distribution within that of the females is a rather unusual case, the more usual situation being a simple overlap of distribution.

Sex Ratio

The three *S. macrura* were one male and two females with testes 2 millimetres long and ovaries 6 and 7 millimetres long respectively.

Forty-seven specimens of *S. hirundo* were internally examined to determine the sex of these, 15 were males, 17 were females, the remainder being too badly damaged to be certain; but of the 15 so affected the majority were probably males as the larger ovaries of the females were much easier to locate. Testis length in the males was 1.5 to 2.5 millimetres and ovary length in the females was 4 to 6 millimetres.

Acknowledgements

My thanks are due to R. H. Appleby of Scarborough for reporting the occurrence to me and ensuring that the corpses were made available; to R. Evison for collecting the corpses in my absence and to David M. Burn who made many helpful comments on the preparation and read through the draft of this paper.

Summary

Fifty-five Common Terns and three Arctic Terns were illegally shot at Filey, Yorkshire on 28th October, 1967. Eleven others were flying round the area. This, together with 66 at Spurn on the same day is the largest number recorded in Yorkshire as late as October. The morphological data provided by this unfortunate source is discussed. All were birds of the year and showed much individual plumage variation. Wing, bill and tarsus measurements are shown and sex ratio, colour of bills and tarsus discussed.

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A NOTE ON THE METHODS EMPLOYED BY CRABS IN BREAKING SHELLS OF DOGWHELKS (*NUCELLA LAPILLUS*)

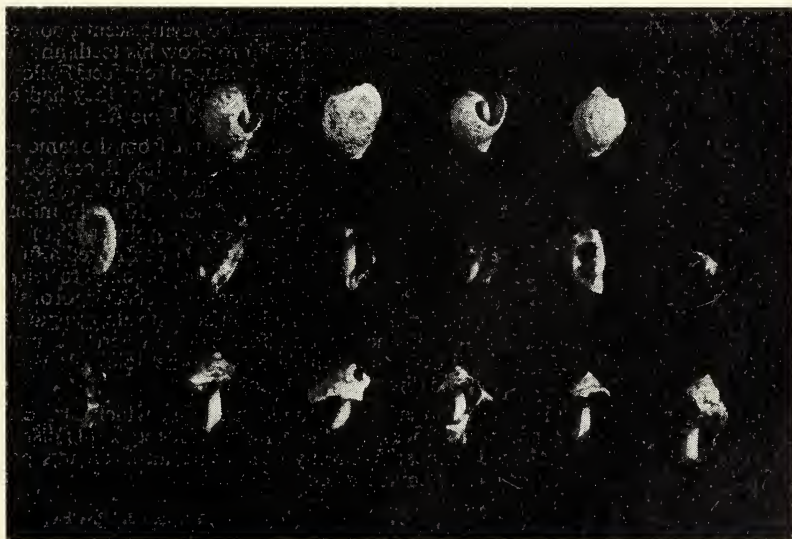
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It is well known that the shells of dogwhelks (*Nucella lapillus*) can be broken by crabs (Ebling *et al.*, 1964; Muntz *et al.*, 1965; Kitching *et al.*, 1966). During a study of a population of dogwhelks inhabiting an exposed reef at Robin Hood's Bay, Yorkshire, it was found that crabs constituted a major mortality factor, preferentially attacking thin-shelled, immature dogwhelks. Two facts led me to investigate the methods employed by crabs in breaking dogwhelk shells. Firstly, Kitching *et al.* (1966) found that in sheltered situations where crabs were abundant, dogwhelks tended to have thicker shells than where crabs were less abundant, and concluded that predation by crabs exerted strong selective pressures favouring thicker shells in their prey. Secondly, two types of damage to dogwhelks' shells were noticed during collections of shell debris from the shore, and by feeding different species of crab with dogwhelks in tanks in the laboratory, it was found that the type of damage was characteristic of the crab species which had attacked the shell. The types of damage due to *Carcinus maenas* and *Cancer pagurus* are illustrated in the Plate, showing that the former break off the apices of the shell whilst the latter breaks the shell more completely. In order to discover how this difference came about, individuals of each species of crab were starved and then watched while they broke dogwhelk shells with shell heights of 19-20 mm.

Cancer held the dogwhelk with the operculum upwards and grasped its prey around the spire with the left chela, the dactylopodite being inserted into the shell aperture. The shell lip was held by the right chela and, with the shell resting on the bottom of the tank, the crab levered down and outwards with both chelae until part of the lip broke off. This process was repeated until the dogwhelk could be removed from its shell.

At first *Carcinus*, on the other hand, held the shell with the apex upwards in the right (smaller) chela, so that the dactylopodite of the left chela could be inserted into the



Dogwhelk (*Nucella lapillus*) shells which have been broken by crabs. Top row: shells broken by *Carcinus maenas*, with the shell apex missing. Centre and bottom rows: the remains of shells which have been completely broken by *Cancer pagurus*.

shell aperture. The crab then used a sawing action on the shell lip with the left chela, chipping away pieces of shell. However, this method of attack was never observed to be successful and after a few minutes the dogwhelk was turned over so that the shell apex pointed downwards. It was held in this position by the left chela, while the right chela grasped the apex. The shell was then slowly rotated about its axis by the left chela and chippings were seen falling from where the right chela was cutting the apex. After about ten minutes the apex dropped off and the crab began eating.

The entire process of cutting the shells by *Carcinus* took about fifteen minutes, contrasting with the rapid breaking of shells by *Cancer*. The latter species of crab is numerically superior on the reef and its ease of attacking dogwhelks may account, to some extent, for its success.

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A BADGER MATING WITH AN HITHERTO UNREPORTED FEATURE.

This mating occurred on 8th June, 1969, at a small two-holed sett in Hawk's Wood in the parish of Thorpe Salvin at the south-easterly tip of the West Riding of Yorkshire. In 1968, two cubs were born here but they left the sett later in the year and were not seen after September 1968. This year (1969), no cubs were seen here.

On the evening in question, the sow emerged from the sett (Hole A) at 8.45 p.m., (i.e. sunset minus 20 minutes), followed immediately by the boar from the same hole. It was a warm evening, cloudless, and with only a gentle south-easterly breeze; the ramsons (*Allium ursinum*) were in full bloom and the scent heavy. Almost immediately and without much caution, both badgers began scratching and laying scent upon each other. The boar then began 'wickering', pulling back his lip to show his teeth and (and this is the unusual point) pawing the ground with both his front and rear feet. Following this, he mounted the sow. Soresly tempted, I risked a photograph after they had been joined for some two or three minutes, whereupon they shot down Hole A.

After three-quarters of an hour (9.45 p.m.) they tried to emerge from the same Hole A, but would not do so. At 9.55 p.m. they emerged from the other Hole B, crossed over to the mouth of Hole A and again after 'wickering' and the same ground 'pawing', the male mounted the female. This time they remained joined for some 10 or 12 minutes, during which time there was the usual 'wickering' of the boar and yelping of the sow as the boar kept her in position by nipping her ears and neck. I then risked a further photograph; again they shot into the sett by crossing to Hole B, only to emerge almost at once from the first Hole A. Yet a third time the boar scratched vigorously at the ground and went to mount the sow. She however, made off at haste along a pathway leading further into the wood. Whereupon the boar sniffed around where the mating had occurred and scratched loose soil from the clearing between the holes all over the area. This done, he then followed in the direction of the sow.

This mating is unusual on account of the ground scratching which Dr. Ernest Neal has neither seen nor heard of previously and he wonders if it represents displacement activity. I would be pleased to hear from any other naturalists on this point. The 'wickering' and neck biting are of course usual.

DR. R. J. PAGET,
Glebe Farm,
HARTHILL,
NR. Sheffield, Yorks.

OCCURENCE OF THE FRESHWATER CALANOID COPEPOD, *DIAPTOMUS LACINIATUS* LILLJEBORG (COPEPODA, CRUSTACEA) IN NORTH WALES

W. J. P. SMYLY

Freshwater Biological Association

Since the only published records of this species in Britain are from Scotland and S. W. Ireland, it is worth putting on record that this species was found in Llyn Bodlyn (Nat. Grid Ref. SH 648240) in Merioneth on 26th July, 1968. This lake is natural but the level was raised in 1894 by the construction of a masonry dam, and it is the main source of water for the nearby town of Barmouth. It has an area of 42 acres, but I have not been able to find out how deep it is. The water is low in dissolved solids. It lies at 1,250 feet above sea-level. The gathering ground is mountainous and uninhabited, "a barren and desolate tract" in the words of Smith, B. and George, T. N. (1961), and used for sheep grazing.

Scourfield (1895) may have been among the first, but was certainly not the last, to observe that planktonic Crustacea cannot be adequately sampled from the shore. As there was no boat, and no road by which a boat might have been brought, I did the next best thing and stood on the middle of the dam where, aided by a following wind, I was able to throw out a net, on a 20 ft. line, into relatively deep water, free of weeds or boulders. The net was cone-shaped, 40 cm. long and 25 cm. in diameter with a mesh of 39 threads/cm. (aperture 170 μ).

The crustaceans caught were almost entirely diaptomids of which about eighty per cent. were copepodids, and though young stages cannot be identified with the same degree of certainty as adults, I am confident that no species other than *D. laciniatus* was present. Adult females were slightly more numerous than adult males. About half the adult females carried eggs, with nine eggs on average in the egg-sac. Samples from three neighbouring lakes, Llyn Irdryn (Nat. Grid Ref. 630222), Llyn Perfeddon (Nat. Grid Ref. 659624) and Llyn Hywel (Nat. Grid Ref. 663268) yielded no *D. laciniatus*, but the first two of these are extremely shallow and the sampling method most inadequate.

In Britain, *D. laciniatus* seems to have been first recorded by Scott and Scott (1897) from Loch Doon in Ayrshire. Murray (1905), in his extensive survey of Scottish lochs, found it mainly in the north-west and absent from all eastern counties south of the Moray Firth. Although in the region of the Great Glen Murray found it at higher altitudes than *D. laticeps*, in S.W. Ireland, where Grainger (1952) found it in four and Farren (1947) in two lakes, it lives in lakes not very much above sea-level. So far, it has not been found in the English Lake District. However the recent discovery of *D. wierzejskii* which has much the same distribution as *D. laciniatus* in Britain, in Cornwall (Galliford 1967) should stimulate further search, especially by those who can go properly equipped to sample the deep water of remote waters.

I am indebted to the Merioneth Water Board for information about Llyn Bodlyn.

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JOINT COMMITTEE FOR THE CONSERVATION OF BRITISH INSECTS

(The following communication has been received. It is printed in full with the exception of a section on the problems of over-collecting. It is hoped to deal with this subject in a later issue).

The Royal Entomological Society called a meeting on 21st June, 1968, to set up an independent, broadly based committee for the conservation of insects, following the dissolution of both its own Conservation (Insect Protection) Committee and the Entomological Liaison Committee of the Nature Conservancy. At its first meeting, on 1st November, 1968, the scope and representation of the new committee was widened so that it now consists of representatives of the Royal Entomological Society, British Trust for Entomology, British Entomological and Natural History Society, Amateur Entomologists' Society, British Butterfly Conservation Society, a representative of the Keeper of Entomology (British Museum (Natural History)) and regional representatives. The Forestry Commission sends an observer, and the Nature Conservancy and Society for the Promotion of Nature Reserves are also represented. Mr. N. D. Riley, C.B.E., has accepted the chairmanship of the Committee.

The Committee's terms of reference are:

1. To prepare a register of species requiring conservation and to investigate their status.
2. To consider what form of conservation (if any) would be the most suitable in any given case.
3. To act as a forum for the consideration of any matters relevant to items 1 and 2 above.
4. To initiate and promote any action that appears necessary for the purpose of securing the conservation of threatened species or habitats, including the promotion of legislation.
5. To act in liaison with the Nature Conservancy, the Conservation Committee of the Society for the Promotion of Nature Reserves and other appropriate bodies in all matters concerning the conservation of British insects and their habitats.

Populations of insects are threatened by many factors in our modern, industrialised society. These threats may be summarised as:

1. **Destruction of habitat.** This is an important factor which is under the control of man. It has been estimated that between 1951 and 1971, 750,000 acres of agricultural land will have been taken for building in England and Wales.

2. **Changes in land use.** Forestry, when it concentrates on the production of conifers, is particularly harmful to insect populations, and so are many aspects of agricultural improvement, such as the destruction of hedgerows, ploughing-up of old pasture and the draining of fens and marshes. Neglect or abandonment of former management practices, such as the coppicing of woodland and grazing of chalk grassland has an adverse effect on populations of some species. Public pressure on the countryside for recreation also affects populations of insects, and this is likely to increase considerably in the future.

It is particularly important to manage wisely those areas of countryside which have not been changed greatly for the conservation of insects and other forms of wild life, so that they can be properly enjoyed by all.

3. **Toxic chemicals and Pollution.** Pesticides (including herbicides) undoubtedly affect many insects adversely. The threats to wild life posed by the use of pesticides are sufficiently serious for a government committee to be considering the restriction of use of certain especially persistent substances which can contaminate the environment well away from the point of application.

The chemical pollution and heating of rivers, streams, lakes and ponds frequently kill aquatic insects on a large scale. Atmospheric pollution from industrial sources may destroy the food or habitat of insect species unable to adapt quickly to change.

It is the task of the new Joint Committee to advise and co-operate with the conservation movement as a whole in finding solutions to these problems. Particular attention will be given to species of national rarity and those in special need of conservation.

All entomologists are invited to bring matters of conservation interest to the attention of the Committee. For further information contact: Dr. M. G. Morris, (Hon. Sec. Joint Committee for the Conservation of British Insects), 41 Queen's Gate, South Kensington, London, S.W.7.

FOOTNOTE

In 1963 the Entomological Section of the Y.N.U. formed a Survey Committee to stimulate and organise the investigation of areas of special entomological interest in the county with a view to assisting conservation and members are asked to consult the Hon. Secretary of the Committee (Mr. Roy Crossley, 2 Mill Rise, Swanland, East Yorkshire) in the case of Yorkshire insects and localities. However, Yorkshire entomologists do not restrict their activities to places within the county and the new Joint Committee should have the full support of all entomologists.

J. H. FLINT,

Chairman, Entomological Survey Committee.

ENTOMOLOGICAL SECTION MEETING AT SKIPWITH COMMON 7th SEPTEMBER, 1969

R. CROSSLEY

A dozen members attended this field meeting which was held near the disused airfield at the Riccal side of the Common. Much useful collecting was done in a variety of habitats and the faunal lists which follow are additional to, and should be read in conjunction with, those published in the report of the meeting on 25th May, 1968 (*Naturalist* 1969, 101).

The following members have contributed records: D. Barnes, R. Crossley, J. H. Flint, T. H. Ford, R. Harris, S. L. Sutton.

ODONATA:

Sympetrum scoticum (Don.) Frequent, but not as numerous as in some previous years; J.H.F.

ORTHOPTERA:

Tetrix undulata (Sow.) Common; J.H.F.

Chorthippus parallelus (Zett.) Common; J.H.F.

HEMIPTERA HETEROPTERA:

Picromerus bidens (L.); R. C.

Kleidocerys trunculatus s. *ericae* (Horv.); J.H.F.

Stygnocoris pedestris (Fall.); R.C.

Drymus brunneus Sahl.; R.C.

Gastrodes grossipes (Deg.); J.H.F.

Dictyonota strichnocera Fieb.; D.B.

Coranus subapterus (Deg.); J.H.F.

Nabis ferus (L.); R.C.

N. ericetorum Scholtz; D.B.

Stalia major (Costa); R.C.

Orius minutus (L.); D.B.

Blepharidopterus angulatus (Fall.); J.H.F.

Orthotylus ericetorum (Fall.); J.H.F.

Cyrtorhinus caricis (Fall.); J. H. F.

Lygus rugulipennis Poppius; R.C.

Stenodema calcaratum (Fall.); R.C.

Saldula saltatoria (L.); R.C.

HEMIPTERA HOMOPTERA:

Kybos betulicola (Wag.) Common on birch; J.H.F.

Kelisia vittipennis (Sahl.) Common on sedges; J.H.F.

HYMENOPTERA SYMPHYTA:

Ametastegia tener (Fall.); J.H.F.

HYMENOPTERA ACULEATA:

Pompilus spissus (Schdt.); J.H.F.

Rhopalum coarctatum (Scop.); J.H.F.

COLEOPTERA:

Notiophilus palustris Duft.; D.B.

Dyschirius globosus (Hbst.); J.H.F.

Trichocellus cognatus Gyll.; D.B.

Bembidion nigricorne Gyll. Common among the heather roots; J.H.F.

Feronia coerulescens (L.); J.H.F.

F. adstricta (Esch.); D.B. J.H.F. states

"Normally an upland moorland species; this was a surprising find".

Agonum fuliginosum Panz.; D.B.

Phytonomus nigrirostris F.; D.B.

Elatér balteatus L.; J.H.F.

Librodor hortensis (Geoff.); J.H.F.

Coccinella 11-punctata L.; J.H.F.

C. hieroglyphica L. On heather; J.H.F.

Myrrha 18-guttata (L.) On pines; J.H.F.

Paramysia oblongoguttata (L.) On pines; J.H.F.

Cis bilamellatus Fowler In dead birch brackets; S.L.S.

Limnobaris pilistriata (Steph.) At roots of *Eriophorum*, commonly; D.B.

DIPTERA:

Sphaerophoria menthastris L.; R.C.*Syrphus auricollis* Mg.; R.H.*S. corollae* Fab.; R.H.*S. latifasciatus* Macq.; R.H.*Helophilus pendulus* L.; R.H.*Eristalis tenax* L.; R.H.*E. pertinax* Scop.; R.H.*Sericomyia silentis* (Harr.); R.H.

LEPIDOPTERA:

Nymphalis io L. (Peacock); S.L.S.*Vanessa atalanta* L. (Red Admiral);

T.H.F.

Pararge megera L. (Wall); T.H.F.*Cirrhia icteritia* Hufn. (Sallow); T.H.F.*Lygris testata* L. (Chevron); T.H.F.*Amathes xanthographa* Fabr. (Square

Spot Rustic); S.L.S.

Plusia festucae L. (Gold Spot); S.L.S.*P. gamma* L. (Silver Y); S.L.S.

Mr. T. H. Ford collected the following moth larvae:

ex sallow *Lomaspilis marginata* L. (Clouded Border)ex alder *Melanchra persicariae* L. (Dot.)ex bramble *Ematurga atomaria* L. (Common Heath)ex Scots pine *Semiothisa liturata* Clerck (Tawny Barred Angle)*Bupalus piniaria* L. (Bordered White)ex heather *Anarta myrtilis* L. (Beautiful Yellow Underwing)*Eupithecia goosensiata* Mab. (Ling Pug)*E. nanata* Hubn. (Narrow Winged Pug)ex ragwort *E. centaureata* Schiff. (Lime Speck Pug)

ISOPODA:

Dr. Sutton has contributed the following notes on woodlice: "Woodlice generally were scarce, the area being too acid and wet. *Oniscus asellus* L. was in heather litter by the side of the road and in brick rubble of old buildings. *Porcellio scaber* was at the latter site and in several rotted birch stumps well out on the common. This was interesting as the intervening ground is usually waterlogged and unsuitable. *P. scaber* and *O. asellus* were also under bark on pine stumps. *Trichoniscus pusillus* (Brandt), was plentiful in leaf litter in young birch scrub".

East Yorkshire Field Studies No. 2, (1969) Obtainable from John W. Neale, Dept. of Geology, The University, Hull. Price 6/-.

In its 45 pages, this second issue of *East Yorkshire Field Studies* carries articles on "Uses of Vertical Air Photographs" (15 pp) and on the Geology of Holderness (13 pp). The latter details many interesting fossil remains as well as the more strictly geological information. Of more immediate interest to naturalists will be the 16 pages which deal with "The Oystercatcher in the Humber Area". This is contributed by B. S. Pashby, the Secretary of the Hull Scientific and Field Naturalists' Club, one of the three enterprising E. Riding organisations who jointly sponsor these publications. It deals with breeding records of the Oystercatcher in the Humber Estuary up to 1950; the extension of its range up-river from the coast since the middle of the century; and the apparent increase in wintering birds. Whilst a number of points are debatable (the author himself states "... these ideas ... must be treated with caution.") it is extremely useful to have a carefully documented paper on the status of just one breeding species, even for a limited (but important) area. This is the sort of study in which our rarity-hunters could be so much more usefully occupied.

R.F.D.

ex birch

Pheosia gnoma Fabr. (Lesser Swallow Prominent)*Notodonta dromedarius* L. (Iron Prominent)*Lophopteryx capucina* L. (Coxcomb)*Phalera bucephala* L. (Buff Tip)*Dasychira pudibunda* L. (Pale Tussock)*Drepana falcata* L. (Pebble Hooktip)*Apatele leporina* L. (Miller)*Cosymbia albipuncta* Hufn. (Birch Mocha)*Eupithecia castigata* Hubn. (Grey Pug)*Campaea margaritata* L. (Light Emerald)*Cabera exanthemata* Scop. (Common White Wave)*Biston betularia* L. (Peppered)

BRYOLOGISTS' VISIT TO SEDBERGH, AUGUST 23-30, 1969

The autumn meeting of the Y.N.U. Bryological Section was held at Sedbergh (V.C.65) in conjunction with the British Bryological Society. 34 members of the two societies attended all or part of the meeting.

Sunday, 24th August was spent in the vicinity of Sunbiggin Tarn V.C.69, where the calcareous mires and springs round the tarn yielded such species as *Cinclidium stygium* in abundance, *Amblyodon dealbatus*, *Gymnostomum calcareum*, *Acrocladium giganteum*, *Drepanocladus revolvens* var. *intermedius*, *Scorpidium scorpioides*, *Moerckia flotoviana* and *Leiocolea badensis**, while nearby acid bogs produced *Polytrichum alpestre*, *Campylopus introflexus* c.fr., *C. brevipilus*, *Cephalozia connivens*, *C. loitlesbergeri* and *Cephaloziella hampeana*. In the afternoon Crosby Gill, a wooded valley cutting through Yoredale limestone, was visited. Here *Barbula spadicea* c.fr., *Blindia acuta*, *Archidium alternifolium*, *Hygrohypnum eugyrium*, *Plagiochila spinulosa*, *Barbilophozia atlantica*, *Lejeunea lamacerina* var. *azorica*, *Cololejeunea calcarea* were found and the rich corticolous bryophytes included *Dicranum montanum*, *Ulota crispa*, *U. bruchii*, *U. drummondii**, *Tortula intermedia*, *Orthotrichum striatum*, *Nowellia curvifolia* and *Riccardia palmata*.

On 25th August, Whernside was explored by several parties. On Greensett Crags, the highest limestone outcrop on the eastern slopes in V.C.64, were found *Encalypta rhabdocarpa*, *Trichostomum crispulum* var. *nigroviride*, *Grimmia trichodon*, *Barbula ferruginascens*, *Seligeria doniana* c.fr., *S. pusilla* c.fr., *S. trifaria* c.fr., *Tortula subulata* var. *graeffii*, *Mnium orthorhynchum*, *Isopterygium pulchellum*, *I. depressum*, *Orthothecium intricatum*, *Barbilophozia barbata*, and *Metzgeria pubescens*. The blanket bog and peat hags overlying the millstone grit of the summit produced *Splachnum sphaericum*, *Calypogeia trichomanis*, *Lophozia excisa* and *L. bicrenata* with *Hyocomium flagellare* and *Marchantia polymorpha* var. *aquatica* frequent in the streams. Great Blake Beck in V.C. 65 yielded *Sphagnum teres*, *Dicranella crispa*, *Tetraphis browniana* c.fr., *Bryum klinggraeffii*, *Pohlia annotina*, *Ulota phyllantha**, *Plectocolea hyalina*, *Solenostoma sphaerocarpum*, *Scapania scandica* and *Lophozia obtusa*. Those who visited Upper Deepdale and Blea Gill (V.C.65) were rewarded with *Dicranodontium denudatum**, *Sphagnum girgenшонii*, *Tetraplodon mnioides* and *Cephaloziella starkei* on the blanket bog and in the Gill *Seligeria pusilla*, *Mnium pusilla*, *Plagiobryum zierii* c.fr., *Eucladium verticillatum*, *Orthotrichum rupestre*, *Rhynchostegiella pumila*, *Plagiochila spinulosa*, *Scapania aspera* and *Cololejeunea calcarea*. In addition, *Rhynchostegiella teesdalei*, *Barbula spadicea* c.fr., and *Fissidens rufulus* c.fr. were found at the bottom of Deepdale and *Leskea polycarpa*, *Orthotrichum lyellii* and *Tortula subulata* var. *subinermis** near the river at Carn Close by Sedbergh completed a satisfactory day.

On 26th August gills in the Mallerstang area were visited. Aisgill in V.C. 69 was notable for *Leiocolea heterocolpos** in its second English station, *Orthothecium rufescens* c. fr. in abundance, *Bartramia hallerana* c.fr., *Fissidens osmundoides* c.fr., *Pohlia elongata* c.fr., *Isothecium holtii* and *Saccogyna viticulosa*. Hell Gill, which forms the boundary between V.C.65 and 69, is a spectacular, vertical sided gorge only a few feet across with its walls covered by almost complete carpets of *Seligeria trifaria*.

*Lophozia excisa** and *Marchantia polymorpha* var. *alpestris** were new V.C. records for 65 near the R.Rawthey at Wandale.

The 27th August was spent in the Lake District, one party exploring part of Naddle Forest, the rest ascending High Street where a great number and variety of species were found. Details will be given in the B.B.S. report.

Cautley Spout and its vicinity has been frequently visited but on 28th August many old records were confirmed. *Tortella densa* was also found here. Fifteen species of sphagna were found including *S. warnstorffianum* and *S. contortum*, and old records confirmed included *Funaria obtusa* c.fr., *Oedipodium griffithianum*, *Fontinalis antipyretica* var. *gracilis*, *Thuidium delicatulum*, *Radula lindbergiana* and *Frullania fragilifolia*. Above the Spout *Bryum weigelii* and *Acrocladium sarmentosum* were found in the bogs and *Amphidium lapponicum* c.fr., *Marsupella ustulata*, *Trichostomum tenuirostre*, *Lepidozia pearsonii* and *Anastrepta orcadensis* on the Crags.

The last day, 29th August, was spent in Upper Swaledale. Rigg Beck ravine in V.C. 69 was noted for *Discelium nudum* and *Trichostomum brachydontium* var. *cophocarpum*. In C.V. 65 *Bryum pallescens* c.fr. and *Weissia controversa* var. *densifolia* were

seen on lead mine waste near the R. Swale and *Frullania fragilifolia* was found at Kisdon Force. Another party visited Fossdale where *Ptilidium pulcherrimum** and *Pedophyllum interruptum* were noted.

Members who visited Twistleton Glen, Ingleton in V.C. 64 to see *Homomallium incurvatum* also recorded *Hypnum callichroum**.

The meeting was favoured with excellent weather except for one day. Thanks are expressed to landowners who gave permission to visit their properties. New V.C.Rs are noted with *.

J. R. DUCKETT.

M. DALBY.

On the 25th August four members of the Y.N.U. decided not to go with the main party but instead to the valley of the R. Rawthey above Uldale House. This deep and beautiful valley contained some very interesting bryophytes and was well worth the slight attention we were able to give to it. The banks by the side of the path we followed were lined with a series of unusual species. One clump of turf which Mrs. Gow and myself examined contained fine material of the hepatics *Sphenolobus minutus**, *Lepidozia trichoclados* and *Mylia anomala*, the first named being a new vice county record. Although the specific name "minutus" implies that the plant is very small yet it can attain a length of up to 3 cm. In the Bryological report for the year 1904 Mr. W. Ingham gives the following interesting note "*Lepidozia trichoclados* and *Jungermania minuta* (*Sphenolobus minutus*) grow in association in a wood on Strensall Common". How strange that we should also find these two rare species growing together in Uldale!

On the rocky banks was also a profusion of *Mylia taylori* and we also collected *Lophozia incisa*. A boulder at the side of the path was covered with *Scapania umbrosa* and on cliffs at the side of a waterfall were masses of *Leiocolea bantriensis*, together with **Philonotis caespitosa*. Mrs. Gow collected *Anoetangium aestivum* and some fine *Plagiobryum zierii* with capsules. There were also *Breutelia chrysocoma* and *Polytrichum urnigerum* and many others on the grassy banks.

On the 26th, on our way back home, we stopped at a piece of moorland by the roadside known as Pudding Howe Hill, Wharton Fell (V.C.69) where there was some *Hypnum imponens*, discovered here by the late Dr. T. H. B. Bedford on 23rd December, 1939. This is a "local" species but fairly abundant where it occurs. *Leptodontium flexifolium* and *Cirriphyllum piliferum* occurred on the railway track at Smardale Station, V.C.69.

I am grateful to Mrs. J. A. Paton for giving her views on some of the hepatics mentioned above.

F. E. BRANSON.

CORRESPONDENCE

Sir,

The recent short paper on 'Some changes in Bird-life in Yorkshire' by R. F. Dickens (*Nat.* 1969; 109-114) is a useful summary of events since the publication of *Yorkshire Birds* (Chislett 1952), and will certainly be referred to in the future by those interested in this aspect of ornithology. It is regrettable therefore that the scientific names of the species mentioned are not included, if only as an appendix.

Vernacular names are notoriously unstable, especially internationally, and to a lesser extent regionally. The American Sparrow Hawk (*Falco sparverius*), which is a true falcon, is perhaps one of the best examples of misleading common names. The Song Sparrow referred to in the introduction need not in years to come be *Melospiza melodia* of the New World unless so stated.

Collective family names such as 'Cormorants' and 'Heron' are undesirable when used for single species unless specified by their binomials.

I note that the author felt the need to use two vernacular names for *Prunella modularis* in the last paragraph.

This subject has received much attention on a national scale and every attempt should be made to ensure that the reader is in no doubt about the species referred to.

JOHN R. MATHER.

SPRING FORAY, MALHAM, 1969

W. G. BRAMLEY

Looking back after the event, Malham was not as good a choice as it seemed at the previous spring foray. The country is all that can be desired, accommodation at the Field Centre was up to standard and we were let off certain chores which normally have to be attended to; but due to the very late, cold and wet spring, vegetation was little advanced and rain greeted us every day at some time or other.

Friday started with rain but by noon the rain had ceased, though skies were grey and a cold wind made loitering rather chilly. The woods in the vicinity of the centre, though having plenty of dead wood produced little, as did the limestone pavements, but samples of dung eventually yielded a good crop of species. Two members finally ended up at Malham Cove and village and were lucky to be picked up soon after leaving on the long and hilly tramp back to headquarters. The next day Clapham and Ingleborough Woods were investigated. Once again rain came soon after midday and a retreat was made to the workroom. More promising weather on Sunday found the party *en route* for Grass Woods, but after an hour's collecting heavy rain forced us back to the cars and Tarn House. Two hardy members from Scotland also visited Barden Tower but did not find things any better there. Finally, a wet Monday morning and those who had not had to leave on Sunday decided to call it a day and depart for home.

At the centre we were allotted a very adequate workroom, a number of mycological works and a card index of some of the fungi which have been previously collected in the area. This present list will no doubt add to this especially the coprophilous species, which until the last three or four years have been neglected for a long time. The following list has been compiled from reports from Dr. M. Richardson especially for dung fungi, Dr. T. M. Hering and the writer.

- B = Barden Tower C = Clapham & Ingleborough Woods
 G = Grass Woods, Grassington M = Tarn House & surroundings
 c = cattle, h = horse, g = grouse, r = rabbit, s = sheep dung
 † = not in *Catalogue of Yorkshire Fungi*
 * = not recorded in *Catalogue* for V.C.64

PHYCOMYCETES

- **Pilobolus kleinii* van Teigh., M.s.
Synchytrium anemones de Bary & Woron., on *Anemone*, G.

ASCOMYCETES

- †*Ascobolus albidus* Crouan, C.r., G.h., M.c.r.s.
 **A. immersus* Pers., B.c., M.s.
 **A. stictoides* Speg., M.s.
 †*Ascozonus woolhopensis* Renny, C.r., M.r.
 **Cheilymenia* cf. *theleboloides* (A. & S.) Boud., M.c.
 †*Corynella prasinula* (Karst.) Boud., on *Acer*, G. (certe R. W. G. Dennis)
 †*Mollisia ramincola* (Rehm) Graddon ined., on *Lonicera xylosteum*, C. (det. W. D. Graddon)
Pseudopeziza petiolaris (A. & S.) Mass., on petioles of *Acer*, G.M.
 †*Saccobolus versicolor* (Karst.) Karst., G.c.h.
 †*Thelebolus nanus* Heim, C.r., M.r.s.
 **T. stercoreus* Tode ex Fr., C.r.

PYRENOMYCETES

- **Cucurbitaria berberidis* (Pers.) Gray, on *Berberis* sp., C.
 †*Coniochaeta discospora* (Auersw.) Cain, M.c.g.
 †*C. scatigena* (B. & Br.) Cain, B.c., M.c.s.
Didymella tosta (B. & Br.) Sacc., on *Epilobium montanum* (certe CMI)
 †*Leptosphaeria microscopica* Karst., on *Phalaris*, M.

†*Melanospora lagenaria* (Fr.) Fckl., on *Polyporus betulinus*, C.

†*Mycorhynchus petchii* Breton & Faurel, M.r. (= *marchalii* (Sacc.) Petch) *certe* Dr. Breton. It is the first time it has been found since described by T. Petch in 1935.

†*Podospora appendiculata* (Auerswald) Niessl, M.g.r.

**P. decipiens* (Wint.) Niessl, B.c., G.h.c., M.c.r.s.

†*Sphaeronaemella fimicola* Marchal, C.r.

†*Sporormia octomera* Auersw., C.r.

†*Sydowiella fenestrans* (Duby) Petrak, on *Chamaenerion*, M.

AGARICALES

†*Coprinus ephemeroides* (Bull.) Fr., G.c.

†*C. miser* (Karst.) Karst., B.c., G.c., M.c.s.

C. patouillardii (*cordispora*) Quel., G.c., M.c.

Psathyrella obtusata (Fr.) Sm., C.

†*P. vernalis* (Lange) Moser, G.

FUNGI IMPERFECTI

†*Fusarium avenaceum* (Fr.) Sacc., M.r.

†*Papularia sphaerosperma* (Pers.) v. Hohn., C.

**Vermicularia trichella* Fr., on *Hedera*, C.

British Fungus Flora : Agarics and Boleti : Introduction by D. M. Henderson, P. D. Orton and R. Watling, Pp. 58. Edinburgh. H.M.S.O. 12/—.

Several good and up-to-date, illustrated books on the higher fungi are available but these all contain selections only of species: the last complete fungus flora of Britain was published nearly 50 years ago and is now obsolete. Much progress has since been made on the study of the systematics and taxonomy of the Basidiomycetes. Monographs on several genera have been issued and a check list of the British species of Agarics and Boleti was published ten years ago. These works however are not easily available and since considerable changes both in generic concepts and nomenclature have been introduced the amateur mycologist's difficulties are formidable.

The appearance therefore of the first part of a new Fungus Flora which aims to cover all British Agarics and Boleti (about 2,000 species will be described) is a notable mycological event. In this introductory part the 111 recognised British genera are assigned to 16 families with four additional families of agaricoid Aphyllophorales. Two keys to the families are provided, one based on macroscopic "Friesian" characters and the other utilising microscopic characters of spores, trama and cap cuticle as well as macroscopic features. There then follow an artificial key to the genera, a glossary, four pages of explanatory line drawings and references to literature and especially to works containing useful illustrations. Included in a back pocket is a colour chart (obtainable separately at 5/—) depicting 81 different colours. Since in no other branch of systematic botany is colour so diagnostically important, the provision of this named series of colours is one of the most valuable features of the work. Esoteric shades such as drab, umber, bay, vinaceous etc. which have conveyed different meanings to different mycologists now take on a precise meaning.

There is no question that this will be an indispensable work for all who are seriously interested in the identification of toadstools and it is to be hoped that succeeding parts will be issued without undue delay.

W.A.S.

Collecting, preserving and studying insects by Harold Oldroyd. Pp. 336. 15 plates 135 figures. Hutchinson, 1970. 25/—.

The second (revised) edition of this useful book has been issued in a paperback form and the price remains the same as the original 1958 edition. The main text has not been altered but there are some new photographs and an additional nine pages detailing improvements in materials and techniques which have occurred during the past twelve years, have been inserted as an Appendix.

R.C.

BOOK REVIEWS

The Trees of Great Britain and Ireland: vol. 1 by H. J. Elwes and A. H. Henry. A facsimile reprint of the original edition printed in 1906. Pp.xvi × 200 with frontispiece and 60 photographic plates, 11 $\frac{5}{8}$ " × 8 $\frac{3}{4}$ ". S. R. Publishers Ltd. 7 guineas.

The original edition of Elwes and Henry's great work was issued in seven volumes between 1906 and 1913. It was a sumptuous work, dedicated to King Edward VII, privately printed and limited to 500 copies. Its costliness put it beyond the means of all but the few and the edition was soon absorbed into the libraries of institutions and those wealthy landowners whose parks and private arboreta had been visited by the authors in the course of their indefatigable search for information. Since then it has become a collector's item. Copies appear from time to time in dealers' catalogues at ever-increasing sums and they do not often require to be offered a second time. In 1968 a copy was advertised for £180; last year the price asked was £220.

The contents therefore of this classic work on "all the trees which grow naturally or are cultivated in Great Britain and which have attained, or seem likely to attain, a size which justifies their being looked on as timber trees" have never been easily accessible to botanists; indeed most present day botanists and tree lovers have never even seen a copy of the work. It is unfortunate that this should be so for the work contains an immense amount of information and no later work on British trees can compare with it for the wealth of detail and the splendid photographs "by skilful photographers specially engaged for the purpose", which it contains.

The original work ran to 1933 pages with 414 plates and descriptions of 565 species. For each tree a full botanical description is given, varieties are described and there then follow very readable accounts of distribution and the history of discovery and time of introduction to this country of exotic species. The accounts of distribution include information and sometimes photographs of notable localities and specimens, often based on personal visits in various parts of the world. Next come notes on cultivation in this country followed by one of the most fascinating parts of all – the account of the finest or most remarkable examples in Great Britain and Ireland of each species, with their dimensions accurately recorded and usually with one or more plates of notable examples. The full treatment for each species may thus extend to 20 pages or more, as for example with beech and yew in this first volume.

The printing of this facsimile edition is beautifully done but it must be admitted that the photographs have lost some of their original splendour in reproduction. There is a dull greyness about them that is lacking in the originals. Many of the fine trees described will probably no longer be standing. The passage of over half a century with two world wars and all the social changes affecting large estates will doubtless have taken a heavy toll. But many of the notable trees referred to will still survive and it would be a fascinating exercise for anyone with the time and inclination, to revisit the quoted sites and estates to ascertain how many of the trees still stand and to re-measure those which do.

In a few instances (e.g. *Sorbus*) the intervening years have seen great changes in species concepts; but for the great majority of species covered the botanical treatment is as relevant today as at the time of publication. This work therefore combines historical interest and value with continued practical utility. It is the publisher's intention to issue volumes at intervals of six months or so in order to spread subscribers' financial outlay. It should therefore be within the means of most botanists to acquire the complete work. Its handsome production and binding certainly make it a work which all botanists and tree lovers will be proud to add to their libraries.

W.A.S.

Ecology of Refuse Tips by Arnold Darlington. Pp. 138 with 40 text figures and 8 plates. Heinemann Educational Books Ltd., London, 1969. 25/-.

Refuse tips are not areas which we normally regard as an integral part of our ecological environments and yet they are often a conspicuous part of our landscape and it is appropriate that our attention should be drawn to them in European Conservation Year when so many people are, or should be, thinking about their surroundings.

In this little book in the "Scholarship Series in Biology" the author covers the range of organisms which may colonise and inhabit the very variable habitats offered by a tip, from almost normal soil to a pond in an ice-cream carton. He points out that they must be species of open habitats able to cope with the often rapidly changing conditions and disturbance.

Mr. Darlington describes interesting experiments and accounts of such things as the spread of *Bryum argenteum* on footwear, the correlation between seed heteromorphy and dormancy in *Chenopodium album*, the biology of certain fungi, the ecology of pools, the tolerance of natterjack toads to polluted waters and the influence of tips in attracting gulls to inland feeding sites. The final chapter deals with the domestic refuse heap and includes useful sketches of the invertebrate animals which may be found there. This may perhaps stimulate gardeners to look at their compost heaps in a new light.

This book is intended primarily for sixth formers but amateur naturalists should also find it interesting and informative.

D.D.B.

Evolution in Plant Design by C. L. Duddington. Pp. 259, with 35 plates (+1 in colour) and 61 figures. Faber and Faber Ltd., London, 1969. 50/-.

Though called "Evolution in Plant Design" this book is really an elementary book of Botany with a special emphasis on the ways in which plants are adapted to their environments. It is written for the most part in non-technical language and most of the physiology is dealt with in a simple readable manner. Sometimes it is made rather too simple and it will certainly be of much more use to the amateur botanist and naturalist for whom it was designed, than for students.

The book deals briefly with all the major plant groups and their ways of life but naturally spends rather more time on the flowering plants than on the lower groups. There are particularly interesting chapters on the orchids, pollination and plant partnerships. In short this is an "old fashioned" botany book which shows how much interest may still be found in plants themselves and not just in their biochemistry and fine structure which is so fashionable today.

One shortcoming of the book is that it gives no references and there are no suggestions for further reading. Mistakes are very few but one, calling toothwort *Lastraea*, could be misleading.

D.D.B.

Private Lives, edited by Jeffery Boswall. Pp.160, with 41 colour plates and 114 black and white photographs. BBC Publication, 1970. 35/-.

The subject of this book is the series of natural history television films currently being shown under the title of Private Lives. Each of the thirteen species covered by the programmes is the subject of a chapter written by the film maker, scientific adviser or someone closely involved with the work. The result is a remarkably pleasant book, more satisfying than the ephemeral screen images. To me, at least, this work shows considerable progress from earlier "book of the film" publications as issued after other cinema or television natural history offerings.

The subjects of each chapter, with their authors, are as follows:- The Robin (David Lack), Emperor Penguin (Bernard Stonehouse), Siamese Fighting Fish (Michael Simpson), Red Fox (Roger Burrows), Kingfisher (Jeffery Boswall), Greater Horseshoe Bat (John Hooper), Grey Seal (J. Morton Boyd), Great Crested Grebe (K. E. Simmons), Large White Butterfly (Claude Rivers), Wandering Albatross (Lancelot Tickell), Hedgehog (Patrick Morris), Starling (Jeffery Boswall), and New Forest Pony (Stephanie Tyler). With such diversity, linked only by the slender thread of a television series, the cohesiveness of the whole is something for which the editor must be congratulated. The abundance of drawings, maps and diagrams throughout the text help considerably to make each account a good, popular scientific coverage of the subject.

In his introduction Sir Julian Huxley gives a brief history of wildlife documentary films. The first single species film in Britain was the "Private Life of the Gannet" produced in 1935 by London Films. The choice of title appears to have been influenced by their contemporary film hit, also a private life - that of Henry VIII. In my weekend newspaper the television series is billed as-"Private Lives (Wildlife) - the Wandering Albatross"; probably in case viewers expect satire or melodrama. However, if the film is as good as its chapter, it will be well worth seeing.

The production of the book is excellent and with its wealth of illustrations it should prove very popular indeed. The drawings by Maurice Wilson are a special feature; those of Great Crested Grebe display postures, are particularly good.

T.M.C.

Population and Food Supply edited by Sir Joseph Hutchinson. Pp. 144 with 11 figures and 13 tables: Cambridge University Press, 1969. 30/-.

Land Use and the Constitution of Property by D. R. Denman. Pp. 27: Cambridge University Press. 5/-.

The essays on which the first book is based, have been written by eight specialists individually appraising a common problem and the title accurately describes this. Technical language has been kept to a minimum making the book easy to read and understand. Each author concludes the urgency of this world problem but holds out hope for the future if appropriate action is taken now. It is also pointed out that many calculations are based on inadequate data. For example Carpenter highlights our lack of knowledge of minimal nutrient requirements and Farmer points to the unreliability of some production data. This book which puts the problem into perspective should have wide appeal to the responsible layman.

Denman's Inaugural Lecture is less rewarding which stems from the difficulty the layman will find in reading it. Yet the logic in his argument and perception of future research should do much to alleviate the burden of reading. C.L.G.

The Vanishing Jungle by Guy Mountfort. Pp. 286, with 88 black and white photographs and 26 colour photographs. Collins, 1969. 63/-.

This is the journal of two recent expeditions to Pakistan, led by the indefatigable Guy Mountfort, accompanied by some of the team who made his earlier works along the same lines so memorable. The same blend of ecology and practical conservation appear in this book, and weave the same spell. For the intending traveller I can imagine no better precursor to a journey, and for the armchair naturalist no better way of evoking atmosphere, than this book. From the endpaper maps, which are most excellent and in colour, through the photographs by Eric Hosking and the text by Guy Mountfort, one gets an impression of the potential of Pakistan as a resort for wildlife, and tourists too, if the hopes of the author are borne out. However, this is not a travel book, nor a sugary account of exotic wildlife. Conservation still has a long way to go in Pakistan, and some of the wasteful slaughter which the expedition encountered must have caused despair at times in the minds of the team. Oil-rich sheiks from the Gulf States flying their falcons at vanishing game bird species, and well-meaning hunters, oblivious of the aims of the expeditions, potting at birds of prey en route, must have given good exercise to the diplomatic powers of expedition members. However, one is left with some hope for the future of the tigers, crocodiles, leopards and the host of threatened bird species.

Since both East and West Pakistan were visited on the two expeditions, the range of country covered, and the actual distances travelled, were immense – from the West Punjab to the Assam border, via desert, high mountains, delta swamps, the strange Sunderbans and the Sylhet jungle. Each provided some focus of interest, and the collective record covered 99 mammal species, 423 birds and 45 species of reptiles and amphibians. The birds ranged from typically oriental forms to palaeartic migrants, and whilst the recorded list is long, one has no impression of a mere catalogue emerging from this work. Perhaps, more than in any previous book by this author, mammals come through most strongly – with tiger, leopard, wolf, snow leopard etc., and a whole range of species from wild boar to jirds, giving an impression of diversity and richness of species. Many of the mammals are of threatened species and the appendix gives a bleak picture for the future survival of the big cats and some ungulates.

However, the Government were sympathetic to the aim of conservation, and some progress was made during the period of the expeditions. One hopes that this will continue. Perhaps the bewitching thought of tourist currency may be the salvation of some of these animals if all else fails. One thing is certain, the author has done a great service to conservation by writing this book and the last word should perhaps be his. I quote "If only we had come to Pakistan ten years earlier! Yet had we done so, perhaps we would have been too late to save the Coto Donana in Spain, or to create the wildlife reserves which resulted from our work in Jordan".

The great majority of the photographs are by Eric Hosking and form an excellent series. He contributes an appendix of photographic data.

T.M.C.

Parasitic Protozoa by **J. R. Baker**. Pp. 176, with 134 text figures. Hutchinson University Library (Biological Sciences) London, 1969. 33/- (Paperback 14/-).

Most biologists possess a nodding acquaintance with parasitic protozoa resulting from an early confrontation with the esoteric mysteries of the terminology associated with stages in the life-cycle of *Plasmodium* or *Monocystis*. Relatively few would claim a wider comprehension of this interesting and important field of study, for which the dearth of straightforward, non-specialist and reasonably comprehensive published accounts is at least partly to blame.

With the advent of Dr. Baker's admirably concise and informative book biologists now have available an excellent introduction to a fascinating world of microparasites. One cannot fail to be impressed equally by the sheer variety of life-cycle and host involvement and by the author's enthusiastic advocacy. Although short, Dr. Baker's account is wide-ranging and of compelling authority. It is written in a free-flowing style and the many well chosen and up-to-date references are placed unobtrusively in the text. Apart from descriptions of the parasites themselves the book contains a useful, if brief, account of techniques used in their preservation, examination and culture in the laboratory. It is strongly recommended to all with protozoal or parasitological interests.

R.W.O.

Echinoderms by **David Nicholas**. Pp. 192 with 27 text figures. Hutchinson University Library, London, 1969. Fourth edition. 12/-.

The appearance of the fourth edition of a book first published in 1962 is convincing evidence of how useful this work has proved to be to students of zoology and it should be pointed out that the present edition has been quite extensively revised. The general plan remains unaltered; brief accounts of the different echinoderm classes are followed by more general chapters on characteristic structures, larval stages and phylogeny, but the incorporation of recent work has resulted in a marked clarification particularly of various palaeontological aspects of the group. Admittedly the internal evolution of the phylum is still frustratingly incomplete, with modern forms appearing in the Ordovician from sources amongst the Cambrian echinoderms which cannot be identified with certainty, but the overall picture is becoming steadily clearer and also an ultimate relationship between echinoderms and hemichordates is becoming more acceptable. Within the compass set this book can be strongly recommended and i, the reader already possesses an earlier edition then the changes in the present edition along with its very reasonable price, would justify a further purchase.

T.K.

Seashore Life in Colour by **Gwynne Vever**. Pp. 108, including 68 pages in colour and numerous line drawings. Blandford, 1969. 21/-.

This little book, the latest in the Blandford Natural History Series, is primarily a simple guide to those animals and plants most likely to be found washed up on the shore. The main emphasis has been laid on those species which, from their size, colouration or bizarre appearance, are most likely to attract and arouse interest in the finder. Thus the jellyfish, echinoderms, crustaceans and molluscs are profusely illustrated, whereas the more difficult and diminutive groups including the sponges, anemones, annelids and polyzoans are represented by a few characteristic species.

More than 265 species are illustrated in colour, the majority of the illustrations, giving excellent representations of the various species, although it is to be regretted that some indication of actual size is not included on the colour plates. The text includes short accounts of the characteristics of the various groups dealt with, followed by somewhat brief descriptions of the species. In addition, simple line drawings depict the relevant points of anatomy and in some instances, special modes of reproduction.

Altogether, this is an admirable book for the introduction of the young naturalist or interested layman, into the fascinating world of life in the sea.

D.E.W.

The Entomologist's Record

and Journal of Variation

A monthly illustrated magazine, founded by J. W. Tutt in 1890, is devoted mainly to the Lepidoptera of the British Isles. It also deals with other orders of insects especially Coleoptera, Diptera, Hymenoptera, Orthoptera. Its articles include descriptions of new species and varieties, reports on collecting trips, distribution, habits and habitats of insects and of collecting and study techniques suitable for novice and expert. It circulates in 47 countries.

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THE YORKSHIRE NATURALISTS' UNION

SUBSCRIPTIONS 1970

There are still many members who have not yet paid in full their £2 subscriptions for 1970. A good number of these have paid £1 under old bankers' orders but have not paid the balance. Reminders to all were sent out in June and the Assistant Treasurer urgently requests that members take immediate steps to send outstanding subscriptions to him thus avoiding unnecessary correspondence and saving a substantial amount in postages. He also requests that out-of-date banker's orders be adjusted to £2 per annum for 1971.

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The University of London awards a Certificate in Field Biology which is available to all persons interested in the study of living things in their natural habitats. The work involves a directed course of private reading at home, attendance at two Practical Courses each of two weeks held in the Summer of consecutive years, an approved plan of field-work suited to the student's locality to be written up in the form of an essay, and examinations.

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The regulations and application form may be obtained from the Assistant Director (Room 14) Department of Extra-Mural Studies, University of London, 7 Ridgmount Street, London, WC1E 7AD.

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FIFTY YEARS LATER – ANOTHER LOOK AT THORNE WASTE

P. SKIDMORE

Half a century ago Peacock (9) painted a glowing picture of Thorne Waste as it had been in the old days, but having witnessed the methodical devastation of the site during the closing decades of the 19th Century he was moved to write in the introduction to his paper on the ecology of this area of primeval bog that “as it is only a question of time before the whole area of turf is removed or covered with alluvium, I have attempted to outline what once existed where high cultivation will wholly prevail in future”.

Peacock then set the modern train of thought amongst Yorkshire naturalists that the glories of Thorne Waste were gone and that the site is doomed. Added to the initial despondency thus caused two other factors have led to a general apathy towards the site; firstly the difficulty of access, not helped by the prohibition without permit imposed on all would be explorers, by the peat-cutting authorities. Secondly the enormous size of the area, which means that a visit to the site without prior knowledge of the terrain can be a dismal failure for, like all good places, Thorne Waste withholds its treasures from the casual visitor. Only those who are willing to put great effort into their studies there can hope to reap the benefits. It is in fact remarkably easy to walk right across the moor without seeing anything of interest.

To return to Peacock's forecast that soon the whole area of turf would be warped over. Though there are Yorkshire naturalists who hold to the belief that Thorne Waste is but a fragment of what it was even in Peacock's day, a comparison of the many maps which through the arduous work of Mr. W. Bunting of Thorne are available to anyone who cares to examine them, reveals that the total area of wild country has remained about the same since the end of last century. Some areas, like Whittaker's plantation, have been cleared since the 1940's, but considerable areas of poor-class warped land contiguous with the moors have reverted to marsh and fen.

Quantitatively then the overall acreage of wild country of which Thorne Waste (or Moors) is a part, has remained the same despite Peacock's forecast to the contrary. It is around 6,500 acres, Thorne Moors accounting for around 4,000. The total acreage of peat moors has remained unchanged during this period although of course the depth of peat has been greatly reduced by the peat-cutting companies.

It is widely recognised that the fauna and flora of any site are always in a state of continual change. Regarding Thorne Waste, Peacock (9) stated that it was a botanical wilderness compared with its state when Appleby first found the Rannoch Rush (*Scheuchzeria palustris*) there in great abundance in 1831, and when the pools, wells and turbaries were full of rare plants. Casson (4), himself no mean naturalist however spoke of these pools and wells being void of plant life in 1829 and remarked that the moors were not what they had been – that Cranberries were far less numerous than they used to be in Stovin's time.* In 1839 Stonehouse (13) also noted how many of the birds of the Hatfield Chace levels had become extinct and more were decreasing as a result of development of the site. Continuing this train of thought into the past we find Abraham la Pryme, writing about 1670 (13), stating sorrowfully that “they don't grow trees as they used to”, and that “most of the woods around Hatfield, Doncaster etc., were felled over 40 years ago”. Further back still we find that the last stag hunt was held on the Royal demesne of Hatfield Chace in 1609, for this, the greatest royal deer forest in the country, covering some 190,000 acres, had fallen from royal favour because it had become a vast morass of bog and fen. During Queen Elizabeth I's reign the last standing pines, remnants of the great old forest of pines and oaks which covered the whole of the Humberhead Levels long before, sank into the morass. Our written records only take us back to 1100 when, in the archives of the de Mowbrays, Lords of Axholme, we read (10) that the whole of the Levels twixt Don and Trent were covered in a “great old decaying forest of oaks and firs”; evidently the forest was not what it had been in even earlier times. How many organisms became extinct over this period of 870 years

*—John Stovin was a “gentleman” of Crowle whose manuscript describing local life around 1730 was discovered in a solicitor's office in Doncaster last century. It was published by C. Jackson in the *Yorkshire Archaeological Journal* VII, 194-238, 1881-82.

since this first record from the de Mowbrays? Many creatures must have disappeared before the Romans came, when, in the early Iron Age the climate began to deteriorate from a warm dry one to a colder, wetter one (Tansley, 14). But more must have become extinct since those times as a result of human development of the area; many birds like the Crane were early in vacating their haunts on the Levels, perhaps as a result of over-persecution that the tables at banquets at Cawood (Nelson, 7) and elsewhere might satisfy the gluttonous. Ruffs, Bitterns and Harriers lingered on longer until they too were forced to leave when their privacy was shattered. And so it goes on, the vast legion of the extinct and the increasing spoilation of man's heritage for commercial gain are favourite subjects for the dismal, who believe that things have gone so far that the future holds only hopelessness. But such pessimistic views amongst naturalists must be discontinued if we are to preserve the remnants of our heritage. Conservation since the turn of the Century has paid real dividends in that many birds, driven to extinction in Britain in the past, have, under shelter of right-thinking conservationists, returned to their old haunts. Great Crested Grebe were quickly increasing many years ago; the Osprey now nests in more than one place, and most recently Ruff, Black Tern and Godwits have started to breed again in England. Great joy swept through the ornithological fraternity when after the war the Avocet again graced England with its company. All these and many more are making Britain a pleasanter place in which to live, thanks to the spirit of conservation which is sweeping through natural history circles, helped by the popular mass media.

At the York Symposium on "The Changing Face of Yorkshire", held in September 1968, the plea went out for surveys of all sites of scientific interest in Yorkshire, and particularly in the West Riding where the greatest pressures of development are expected. Surveys provide the conservationist's ammunition, and it is being increasingly recognised even amongst the general public that conservation is vital to the well-being of the community. With increasing leisure and increasing population the few amenity areas available at present are totally inadequate. In 1967 the natural history societies of the West Riding and the individual members of the Yorkshire Naturalists' Union were requested by Mr. L. N. Fraser, West Riding County Planning Officer, to make a list of sites of special interest in the county, so that his Department could take these into account in all overall amenity plans for the county. Thus considerable safeguards would be lodged with the appropriate authorities against unnecessary destruction of interesting sites, and the West Riding would be able to retain as much as possible of its distinctive natural beauty and interest.

The list was completed and forwarded to Mr. Fraser at the end of 1967. Thorne Waste was placed high on the list as a habitat type of particular interest, rather than the home of any particular rarities. This general statement was given because an up-to-date assessment of its fauna and flora was not available. However, as it had pride of place on the list of sites it was assumed that survey work there would be permitted to take a leisurely course over the ensuing years without threat of the site being annihilated. But already in April 1968 a threat of precisely this type loomed up.

Some time previously the Central Electricity Generating Board had purchased Burn airfield near Selby expressly for the purpose of tipping pulverised fuel ash (fly ash) from the new Drax Power Station. However public opposition to the scheme at Burn village forced a Public Inquiry and in the closing phrase of the resultant report (3), the presiding Inspector recommended that the proposal to tip on Burn airfield be refused. At the Inquiry a large number of alternative sites were suggested and of these the West Riding County Planning Officer said that Thorne Waste was the most suitable; in fact he considered it more suitable than Burn airfield (Burn Report; item 160 a).

Local and regional natural history organisations and private individuals were quick off the mark in springing to the defence of the "Waste" and showering the relevant authorities with protests. Nevertheless in April 1969, the Central Electricity Generating Board made proposals to the Thorne Rural District Council giving four alternative sites within their area, two in the Sykehouse and Fishlake districts and two on the moors east of Thorne colliery. One of these latter, apparently favoured by the West Riding County Planning Officer, was situated immediately to the east of Thorne Colliery, the other, being on Crowle Yorkshire Moors was more particularly the concern of the Isle of Axholme Rural District Council. The Rural District Councils concerned were immediate and forthright in deploring the proposals and public opinion generally

was likewise revolted by the thought of another authority dumping its rubbish upon them.

Time was now pressing for something concrete from naturalists to support their claims concerning the scientific importance of Thorne Waste. So, in April 1969, Mr. W. Bunting, knowing that the writer was interested in the site, contacted him to see if the Natural History Department of the Doncaster Museum and Art Gallery would assist him in surveying the entire area of moorland and rough pasture between Goole, Thorne and Crowle with a view to establishing once and for all its real scientific importance. For years Bunting had been working on all branches of natural history on these moors, although most of his time had been taken up in gathering data relating to the ownership of the land, and in finally registering it as Common in accordance with the Royal Decree and Award of 1630. The going had been difficult and arduous for him since extensive business interests and high finance had over the years been successful in withholding the land from its rightful owners – the inhabitants of the Manor of Hatfield (now Thorne Rural District) (see Royal Decree and Award, in Outline Study (2)).

With close liaison established between Bunting and the Doncaster Museum natural history staff, a plan of campaign was immediately formulated. The first stage was to set down in dossier form the legal history of the site, Bunting's part of the task, and to extract from the literature all available records relating to the flora and fauna. This latter task was considerable as it necessitated not only perusing the entire run of the *Naturalist* but also studying the many historical works dealing with the area. As stated the earliest record of tree species dates from the de Mowbray archives for 1100; the earliest mention of herbaceous plants growing wild on the Levels appears in the same archives in the year 1357, when "flags and reeds for thatchwork" were referred to. By piecing together the wealth of old records, and by continual cross-referencing it has been possible to obtain a clear picture of the vegetational history of these Levels.

The first stage of the project was completed in early June 1969, the data being kindly xeroxed by the Thorne R.D.C. through the offices of Mr. Bunting. Copies of the resultant dossier were limited to 11, but these were widely circulated and many bodies have seen fit to make photocopies of this document which runs to upwards of 150 pages. It was entitled "An Outline Study of Hatfield Chase" (2).

With the first stage completed came the news that county and national conservation bodies, unlike the local authorities concerned and local naturalists, were no longer willing to oppose the C.E.G.B. However, the Bunting – Doncaster Museum project entered phase two, the formation of a survey team to assess the present fauna and flora of the site. The team consisted of Mr. Bunting and his sons, William and Nicholas, both very keen and competent naturalists, the staff of the Doncaster Museum Natural History department and local naturalists including Mr. R. Mitchell, President of the Doncaster Ornithological Society, and Mr. J. Griffiths of the Rotherham Natural History Society. Mr. Mitchell and Mr. R. Rhodes joined forces with Bunting and two Thorne ornithologists, the Verhees brothers, in bringing the original list of birds in the Outline Study up to date.

Thus in mid June 1969 the survey work began and it is significant to note that four weeks after its commencement, a preliminary report on the findings which was submitted to Dr. H. Frankland, North Regional Officer of the Nature Conservancy, caused her to contact the West Riding Planning Officer advising him that the site was of great scientific importance. She told him that should the threat of ash tipping be averted, she would set machinery in motion to have Thorne Moors designated as a Site of Special Scientific Interest. The tide had turned after only four weeks surveying, and soon the nature conservation organisations were back on course, convinced that the site should not be devastated. The preliminary report which produced this change of heart merely listed the plants still growing on the oldest peat cuttings and compared them with those listed by Peacock (9). It seemed clear that Thorne Moors was now botanically richer than it was in Peacock's day; that many of the plants presumed to have been exterminated when the old turbaries were warped over in the 1840's had re-appeared.

So far the survey team has only worked in any detail those particular parts of the moorland complex which were specifically recommended for the tipping of ash by

the C.E.G.B. cursory meanderings elsewhere on the moorland area have tended to suggest that while the best bog flora is found in the oldest peat workings to the east of Thorne Colliery and which the West Riding County Planning Officer recommended for tipping, other sectors of the region contain better fenland communities.

All available evidence then suggests that the oldest peat workings contain the richest peat bog flora, but that slowly the more recent ones become colonised by the same plants as their particular stages in the succession occur. It is expected that many plants undiscovered by recent surveying, still grow in these oldest cuttings. Amongst the more interesting plants which have been noted in the oldest workings during 1969 are *Osmunda regalis*, frequent; *Ophioglossum vulgatum*, doubtless a warp influence plant; *Lotus uliginosus*, abundant along the tracks; *Viola stagnina*, rare; *Potentilla palustris*, abundant; *Drosera rotundifolia*, abundant; *D.intermedia*, abundant in one place; *Pinguicula vulgaris*, scarce; *Lythrum salicaria*, common; *Hydrocotyle vulgaris*, abundant; *Myrica gale*, scarce; *Salix repens*, frequent; *Andromeda polifolia*, common, locally abundant; *Vaccinium oxycoccus*, common; *Lysimachia vulgaris*, common; *L.nummularia*, common along track; *Menyanthes trifoliata*, scarce; *Utricularia vulgaris* abundant, flowering profusely; *Lycopus europaeus*, common; *Valeriana dioica*, scarce; *Triglochin palustre*, frequent; *Potamogeton polygonifolius*, frequent; *Juncus bulbosus*, common, floating in canals (dikes) and pools; *Typha latifolia*, common; *T.angustifolia*, common; *Sparganium erectum* and *S.emersum*, frequent; *Eriophorum angustifolium*, fairly common though less so than *E.vaginatum* which is dominant over large areas; *Eleocharis palustris*, common; *Scirpus tabernaemontani*, common, dominant in some canals; *Cladium mariscus*, some fine large clumps in main canal; *Carex curta*, common; *Calamagrostis canescens*, common; *C.epigejos*, several clumps along main path.

Several of these had not been seen on these moors by Peacock (9), but the most notable one is *Cladium mariscus* for which the only record for Thorne Waste was from the turbaries prior to the warping and hence presumably pre-1840 (Peacock *loc. cit.*).

The old peat cuttings are also of considerable entomological interest for, although still virtually unworked in this field some rarities turned up during botanical survey work during 1969. The most interesting Dipteron taken was the Mantis fly (*Ochthera mantis*) a very local insect of the oldest peat bogs and unknown elsewhere in Yorkshire. Amongst the Hemiptera taken in this part by Mr. R. Crossley was the fenland *Anthocoris limbatus* known from only one other Yorkshire marsh near Barnsley. The moths include the Mullein Shark (*Cucullia verbasci*), the Scarce Vapourer (*Orgyia gonostigma*), a small casebearing moth *Coleophora trochilella*, a local veneer moth *Crambus margaritellus* and many others. The very rare plume moth *Trichoptilus paladum* recorded from Thorne Moor at the turn of the century should be sought here amongst the *Drosera*. Ornithologists visiting this part at night in summer can listen to the Nightingale and the Nightjar. Doubtless these favour the deep cover afforded by the *Pteridium-Betula* community which covers the drier raised parts of this sector and the dense *Rhododendron* thickets which are steadily encroaching from the moor edges where in the middle of last century, William Casson of Thorne planted his garden (Tomlinson (15)). All that now remains of the garden are these showy shrubs and another related one, *Kalmia angustifolia*, which is running rampant in the southern corner of the moor.

The greater part of the moorland system is covered by birch scrub (both *B.verrucosa* and *B. pubescens*) rising in parts to semi-mature woodland. In the wetter parts willows of several species abound while over considerable areas young seedling oaks are sprouting up. This is surprising since fruiting oaks are only known around the edges, so that a seedling may be two miles from the nearest fruiting tree. It is made the more curious by the large numbers of these seedlings. Among other trees growing on these moors are Hawthorns, widespread and locally numerous; Aspens, scattered all over the area; Scots Pine, very rare; Mountain Ash, also not as common as might be expected (Peacock (9) states that he had no proof that they had every grown on Thorne Waste); Alder, again curiously infrequent; and Hazels, which apparently shun the peat but grow on the reverted warplands.

Entomologically the richest tree is the birch, the foliage, dead wood and associated fungi supporting a large fauna. Amongst the foliage feeders may be mentioned Miller moth (*Apatele leporina*), the largest British sawfly (*Cimbex femorata*) and the shield bugs *Elasmucha grisea* and *Elasmostethus interstinctus* which sometimes abound

in autumn. When a birch reaches its allotted span and decay commences with the aid of various fungi a host of insects move in. With the Birch bracket (*Piptoporus betulinus*) come such beetles as *Tetratoma fungorum* and many others. The striking beetle *Triplax russica*, which as far as Yorkshire is concerned is something of a Hatfield Chase speciality favours the hoof-like fungus *Fomes fomentarius* which seems to be more numerous on Hatfield Moors and in such Doncaster woodlands as Sandall Beat, rather than on Thorne Moors, but beetle and fungus occur in all three localities. The curious black globular fungus *Daldinia concentrica* has not been assiduously worked on Thorne Moors but its fauna will doubtless contain the same beetles as have been found to affect it at Sandall Beat and Hatfield Moors (i.e. *Litargus connexus*, *Mycetophagus atomarius*, *Cryptophagus ruficornis*, *Synchita humeralis*, *Diphylus lunatus* and *Platyrhinus resinovus*); a small moth *Tinea fulvimittrella* whose larvae devour this and other fungi, certainly affects this fungus on Thorne Moors. With increasing decay of the tree other beetles move in, the Cardinal Beetle (*Pyrochroa serraticornis*) and the Tenebrionid *Hypophlaeus unicolor* to breed directly under the bark, others like the longhorns *Strangalia maculata* and *S. quadrifasciata* to mine deep into the wood itself.

A study of the animal and plant associates of any one of the dominant plant communities would make a worth-while pursuit for the student ecologist; indeed it is principally in those parts of the moors which have the appearance of monotony that such studies can most effectively be carried out, for in the parts with the most complex flora, the fauna becomes extremely complex. Large sections of the drier moors are covered with *Pteridium* growing beneath birch scrub, while wetter parts may be almost pure *Eriophorum* or *Juncus* bog. It is principally in the *Pteridium* that Nightjars are found and where Adders are to be seen basking in the sunshine.

On one of the most extensive wet areas is a thriving colony of Black-headed Gulls and duck abound in such places, mainly Mallard and Teal during summer, but with additional species in the winter. Peacock (9), bemoaning the loss of the Rannoch Rush (*Scheuchzeria palustris*) from these moors put its disappearance down to improved drainage and warping over of the decoys and turbaries, with the resultant drop in wildfowl visitations. He believed it to be duck carried. Only 40 years after Appleby found this plant in 1831 in great abundance on Thorne Moors it had "become extinct" (Lees, 6). Pigott (11) showed however that it had grown on these moors from earliest times since its remains were at all levels in the peat. If Peacock was right in believing it came with the ducks on passage from the north it seems conceivable that it will turn up again. Can we be certain that it really became extinct in the 1870's merely because it has not been seen since? The presence of an organism is not always easy to prove; proof of its absence may be quite impossible. *

The great areas of *Eriophorum* bog are worthy of close study by naturalists of all persuasions. It is in these situations that the most interesting resident butterfly will be found – the Large Heath (*Coenonympha tullia*) – for its larvae feed on this plant. During July 1969 this butterfly was again in good numbers in suitable situations though down the years each time there has been a severe heath fire it has been feared that the butterfly had become extinct. Peacock's (9) firm conviction that no plants became extinct here through heath fires, a natural hazard, could perhaps be extended to insects too.

In many of these *Eriophorum* bogs the plant succession to drier moor can be clearly seen. Pools become choked with *Juncus bulbosus* and *Sphagna* and cushions form upon which *Andromeda*, *Vaccinium oxycoccus* and *Erica tetralix* take hold before the bog finally dries out sufficiently for *Calluna* to take over. The snowy beds of cotton-grass change slowly into blankets of purple heather and the Large Heaths diminish as moths

*The likelihood of *Scheuchzeria* being refound at Thorne is virtually negligible since no part of the moor has escaped drainage, warping, firing or peat cutting and *Scheuchzeria*, which demands a permanently waterlogged habitat, is the first plant to go on interference with its habitat. Species normally associated with it elsewhere – and formerly at Thorne – viz. *Carex limosa*, *Rhynchospora alba* and *Drosera anglica*, have also not been seen there during the present century, yet these are somewhat less sensitive to interference. The presence of rhizomes in the peat is without significance save as a pointer to its prevalence several centuries ago. Rhizomes have also been recorded in plenty from Somerset peat bogs where no record of the living plant has ever been made. Peacock's idea about duck-carriage is pure speculation.—Ed.

of the *Callunetum* like Emperor, Northern Eggar, Fox, Common Heath and Beautiful Yellow Underwing move in. With these come their parasites like the enormous Larvaevorid fly *Larvaevora grossa*). In the damper parts too the superb ground beetle *Carabus nitens* should be looked for before the site dries out and the Green Tiger beetle (*Cicindela campestris*) takes over as the major Coleopterous predator of the field layer.

The seemingly barren-looking places also need to be closely scrutinised for the unexpected for it was in a most unpromising place where a drier *Pteridium-Betula* thicket bordered an almost pure *Juncus effusus* bog that the curious and extremely local Scatophagid fly *Pogonota hircus* was first noted on Thorne Moors in July 1969. Previously only known in Yorkshire from the Malham district, this is an Arctic high-boreal species (Hackmann (5)). Again in a quite worthless-looking, recent peat cutting containing about an inch of water overlying several feet of peat mud the water beetle *Acilius canaliculatus* was seen in numbers. Yorkshire is one of the few counties where this beetle occurs in Britain although with us it is found widely in the Humberhead levels from Skipwith Common down across Hatfield Chase. Bunting (1) records it in great numbers on Thorne Moors. Another uninteresting looking dike was examined one day in early June, when it was noted that many different species of flies were skimming over the water. With great difficulty a selection was netted. The Muscids *Lispe tentaculata* and *L. uliginosa* were both present – the former a common marshland fly, the latter seemingly another Humberhead Level speciality in Yorkshire–also two very local Dolichopodid flies, *Campsicnemus scambus* and *Hydrophorus albiceps*, the latter, like *Pogonota* being only otherwise known in Yorkshire from the Malham area.

The moors are traversed by numerous tracks along which trucks were drawn for removal of peat; some are still in operation but more are abandoned. Peacock (8) noted that these were of ecological interest since they formed niches for plants which would not otherwise grow on a pure peat moor. He lists the plants only found on these tracks and except for a few species which have arrived since his day (i.e. *Senecio viscosus*) his list is equally applicable today. In general the flora resembles that found on the reverted warplands, including species like Twayblade (*Listera ovata*), Red Bartsia (*Odontites verna*), Agrimony (*Agrimonia eupatoria*) and Eyebrights (*Euphrasia*). These with the abundance of clovers and trefoils supporting Common Blue butterflies and Burnet moths, and the numerous Helicine snails supporting such local snail flies as *Statinia marginata* indicate a decidedly alkaline soil. This last-named fly is extremely local in Yorkshire, elsewhere known only from Flamborough and near York.

The rough pastures and fenland which are developing on the old warplands are well worthy of a special study. In many places *Calamagrostis canescens* abounds amongst *Phragmites* fen and *Salix* carr and in one such place a fine growth of the Marsh Pea (*Lathyrus palustris*) was found during July 1969. Warping involved covering the peat, or land from which most of the peat had been removed, with alluvium from the Ouse, Humber or Trent. Certain plants conveyed during this process set up alien communities. One of the species mentioned by Peacock (9) as soon disappearing once the warping was finished, *Scirpus maritimus*, still flourishes on a "reclaimed" well where it has settled down with *Eupatorium cannabinum* which Peacock says used to occur on the old turbaries. This particular site is an extensive reedswamp cum *Salix-Frangula alnus* carr. Insects abound there and include local beetles like *Badister sodalis*, while birds like Bittern and Spotted Crake have been noted there in recent years. Happily this is one of the least accessible parts of the whole moorland area.

As a result of the investigations of the survey team two natural history trips were organised onto the moors during 1969. On August 16th the Lincolnshire Naturalists visited Crowle Yorkshire Moors where some members of the party saw the Great Yellow Rattle (*Rhinanthus serotinus*) among other interesting things. On September 28th the Bryological Section of the Yorkshire Naturalists' Union explored the old peat workings east of Thorne Colliery which the West Riding Planning Officer suggested for the tipping of ash from Drax Power Station. Earlier, during July and August Mr. R. Crossley and Colonel J. Newman visited one or other of these two sites.

Thanks are offered to Mr. Bunting for initiating the survey and to his wife and family for their help. Also to the Chairman and members of the Doncaster Corporation Amenities Committee and Mr. J. Barwick, Curator of the Doncaster Museum and Art Gallery for their keen support of the whole project. Finally to all who have in any

way helped in endeavouring to avert the threat to this unique site and especially to Mr. E. Mellor, Clerk of Thorne Rural District Council. It is hoped that the future will see a more lasting regard for this area, that more naturalists will help in surveying its fauna and flora and that visitors will not be content merely to see what has been found for them, but will discover new treasures for themselves.

Finally to those who plan the future landscapes of our country we would refer them to the words of our late King George VI: "The countryside and wildlife of today are not ours to dispose of as we please, we must account for them to those who come after".

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THE FOOD OF SUBURBAN TAWNY OWLS

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The pellets produced by a pair of Tawny Owls *Strix aluco* have been collected from a small wood located in the middle of the Manchester suburb of Crossacres. Analysis of these pellets provides an interesting comparison with a similar (though more thorough) analysis by Beven (1965) on the food of this owl in the London area.

Site

Park Wood (Map ref. SJ832872) is a piece of mixed woodland, comprised of about 220 mature trees, mostly oak *Quercus robur* and sycamore *Acer pseudoplatanus*. There are a few beech *Fagus sylvatica*, horse chestnut *Aesculus hippocastanum*, holly *Ilex europaeus*, ash *Fraxinus excelsior* and hawthorn *Crataegus monogyna*; also a single Larch *Larix decidua* and about 10 pine *Pinus sylvestris* which are the principle pellet-dropping stations. There is very little ground cover, some bramble *Rubus fruticosus* agg, rushes *Juncus* sp. and various grasses. A small stream runs along one side of the wood and there are six or seven very small ponds in it. The wood is only 300 metres long and 100-150 metres wide, that is about 3 hectares (7.5 acres). If, like the tawny owls during the earlier part of Southern's (1954) study, these owls had a territory of about 25 hectares (60 acres) centred on this wood, then the rest of the territory would be entirely made up of small suburban gardens, part of the Wythenshawe council housing estate. However, in the circumstances the owls might have had a rather larger territory – within one kilometre of the southern edge of the wood are four similar, though smaller, pieces of woodland and about 30 hectares of open ground which is currently (November 1969) being built on.

Methods

The wood was examined (by R. J.) for pellets every weekend from January to the middle of July 1969, at which point the observations were terminated by someone shooting the owls, both corpses being found in the wood. It is quite clear that the owls had pellet-dropping stations in other localities, for in some weeks no pellets were found. Even when there was a good collection of pellets, it is most unlikely that they represented the total diet of two tawny owls for a full week, since the maximum number of prey animals recorded in one week was 18, representing about 750 g of food. A pair of tawny owls would weigh about 600 g and would obviously need more food than this in a week. The pellets were dissected by hand and the contents examined with the aid of a binocular microscope (by D.W.Y.). Mammals were identified and counted on the basis of skull and lower jaws; the latter were sorted into left and right dentaries, the highest number in any category being taken as the minimum number of prey represented in one week's collection of pellets. Bird remains were identified mainly on skull remains but counted either from these or from humeri. The humeri were also sorted into left and right, and the maximum number in any category (skull, left humerus and right humerus) similarly taken as the minimum number of prey. Amphibian remains were mostly limb bones. Counts were based on the composite radio-ulna or tibio-fibula.

For the purposes of comparison, both from week to week within this study and with the results of other ornithologists, the prey have been converted into "prey units" (Southern 1954), based on one small mammal as a unit weighing about 20 g. The conversion factors used are the same as those of Beven (1967), thus the house sparrow *Passer domesticus* is considered to be 1.25 prey units, starling *Sturnus vulgaris* and thrushes *Turdus* sp. are four prey units each. We have assumed that *Rana temporaria* is one prey unit.

Results

As table 1 shows, the main prey animal of these owls was the house sparrow *Passer domesticus*, which provided over 50% of the total food. Starlings, *Sturnus vulgaris* were also an important item of diet, 33% of the prey units. Other birds included three small specimens only identified from humeri, probably small warblers, and single examples of a large thrush, probably *Turdus merula*, and *Fringilla coelebs* (Chaffinch). Mammals were very few, providing only 9% of all the prey units, and included only *Apodemus* sp. (Wood Mouse), *Microtus agrestis* (Field Vole) and a single *Rattus* sp., probably *R. norvegicus* (Brown Rat). The rest of the diet was made up of 5 *Rana temporaria* (Common Frog). No pellets appeared to contain either insect remains or earthworms – earthworm chaetae would usually be visible under a binocular microscope if present.

Table 1. Results of analysis of Wythenshawe Tawny Owl pellets (combining all weekly samples, January-July 1969).

	No. of Prey	Conversion factor	No. Prey Units	% Prey Units
<i>Passer</i>	83	1.25	102.5	52.5
<i>Sturnus</i>	16	4	64	32.8
<i>Turdus</i>	1	4	4	2.1
<i>Fringilla</i>	1	1	1	.5
? <i>Sylviidae</i>	3	0.5	1.5	.8
<i>Apodemus</i>	8	1	8	4.1
<i>Microtus</i>	4	1	4	2.1
<i>Rattus</i>	1	5	5	2.6
<i>Rana</i>	5	1	5	2.6
TOTALS	122		195	

It must be admitted that the sample of prey is a very small one. Beven (1965) recorded 510 prey units from Holland Park, Kensington, while we found only 195. This limitation is particularly evident when the results are analysed on a weekly basis, for in some weeks there are no pellets at all, and often only one or two. This analysis is summarised in fig. 1, where the percentage of prey units in each weekly sample is indicated. The number of pellets on which each sample is based is indicated above the sample. Naturally, the samples included complete pellets and a certain amount of

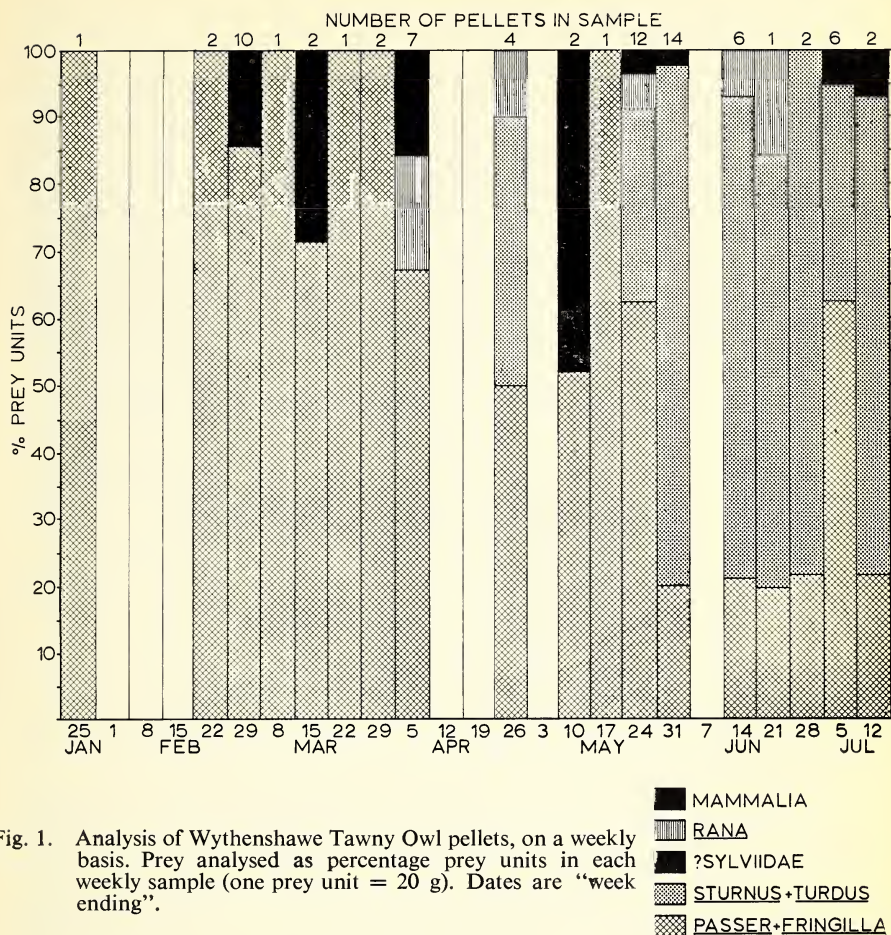


Fig. 1. Analysis of Wythenshawe Tawny Owl pellets, on a weekly basis. Prey analysed as percentage prey units in each weekly sample (one prey unit = 20 g). Dates are "week ending".

debris. The prey units from the debris have been used to estimate the number of pellets which the debris represents by assuming that there are 1.7 *Passer* per pellet (55 were recorded from 32 complete pellets) or 0.7 *Sturnus* per pellet (seven were found in 10 pellets). It will be seen that there is a marked change in the diet midway through the study period when *Sturnus* first appears in the record. One specimen occurred in the week ending 26th April, there were none in the two succeeding weeks (represented however by only two and one pellets each) and then from 24th May through to the end of the study on the 13th July, *Sturnus* provided 30-75% of the diet. Of other prey species, *Rana* only appeared in the pellets from April onwards, as would be expected.

Discussion

It is well known from the extended studies by Southern (1954, 1969) that in deciduous woodland, the main prey of *Strix aluco* is small mammals, contributing around 65% of the prey units, and that larger mammals, rabbit *Oryctolagus cuniculus*, mole *Talpa europaea*, etc. may contribute a further 30% while birds form only 4% of the prey. Beven (1964, 1967) shows essentially similar results from Bookham Common, on the

edge of the London area. However, the present results are essentially comparable with those from Holland Park, Kensington, where Beven (1965) found that birds provided 93% of the diet and mammals only 7%. Our own figures of 89% and 9% respectively, are clearly very similar in general, and further agree in detail in that *Passer domesticus* is the main single prey species, 27% in Holland Park, 52% in Cross-acres. The results differ however in the importance of *Sturnus vulgaris* in this study (33%) and the importance of *Columba* sp. (22%) to the Holland Park Owls. The change to a larger prey, *Sturnus* recalls the similar change, to larger mammals, recorded by Southern (1969) with the Wytham Wood owls. The single *Rattus* in our analysis also occurred in this period, accounting for the importance of Mammalia in the week ending May 10th. It seems probable that, as suggested by Southern, this represents a change in the availability of prey. *Sturnus* probably return to breed in the wood at about this time, and are perhaps then available, when roosting at night, to the owls. During the winter, these birds roost communally in the centre of Manchester, and are not particularly in evidence at Crossacres at dusk, though conspicuous enough in the daytime. Further, young *Sturnus* would be fledging from mid May, and while it was not possible to age the bird remains, one may suspect that the owls would find these an easier prey.

We wish to thank D. Bramwell for checking certain difficult bird remains.

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Flying Birds by David and Katie Urrie, foreword by Peter Conder. Pp. 191, Vernon & Yates Ltd., 1970, 50/-.

Although it contains a well written, easily understood description of the mechanics of bird flight and many of the picture captions are explanatory, this is basically a picture book; the authors say that their concern is with the beauty of the bird in the air. Opinions will be sharply divided on the question as to which of the many illustrations may be considered aesthetically pleasing, and I find myself widely at variance with the writer of the foreword on many points. None of the cut-outs of birds – without surroundings other than the plain white of the page – appeal to me except as records of positions adopted in flight, and some have almost the appearance of laboratory specimens pinned out for a dissection class. Other reproductions are from excessively grainy and obviously unsharp originals. Furthermore, any critical ornithologist will notice that a number of white bodied birds are shown as near black beneath, and some of the shots of Arctic terns show the grey underparts far darker than they are naturally.

However, having dealt with the most noticeable of the book's shortcomings it is a pleasure to be able to say that it does also contain many fine pictures. There are some lovely shots of sea-birds, particularly of fulmar and kittiwake, while the pictures of wader flocks – notably those of knot – are very impressive. Swans and geese are also effectively shown, some of the results being very satisfying. Smaller land birds are never easy to photograph when in flight, and although many have tried to obtain pictures of starlings in flock, few have succeeded. The pictures of this species in this book are above average, that on page 165 being quite the best of the subject I have seen.

At the price *Flying Birds* may be considered to be something of a luxury for the average ornithologist, but he or she may decide to buy it because a note after the foreword says that a part of the proceeds of its sale – I wish we had been informed what proportion – will be given to the British National Appeal of the World Wildlife Fund.

A.G.

INDICATIONS OF THE FEEDING OF SOME WINTERING DIURNAL BIRDS OF PREY IN SOUTH-WEST LANCASHIRE.

C. SIMMS

A survey of the winter avifauna of approximately four thousand acres of coastal dunes and pinewoods between Southport and Formby, at the instigation of R. Wagstaffe of Liverpool Museums, was conducted during the three seasons 1961-64. Opportunity was taken to collect fresh pellets and other food remains at roosting-sites after flushing identified raptors, and a little further information was obtained by chance observations of daylight hunting by some species. Most results were obtained between October 1961 and March 1962, when a relatively large variety and number of predators were present.

Pellets were measured by caliper before drying and subsequent dissection. Bone content was compared with material at Liverpool Museum, chitinous and fur material microscopically at the Yorkshire Museum, York, although only some beetle elytral fragments and the fur of Rabbits proved determinable. Amongst the bony parts of mammals, teeth alone were used to determine species, for birds only skull parts.

Observations of hunting raptors were few and have been noted, together with summaries of the reactions of other birds observed, whether potential prey or not.

Only some 200 'winter' daylight hours were spent in the study area each season, and these notes do not report the findings of other observers. The remarks on status are summarised from observations made during the avifauna survey and those on field recognition characters refer to the individual raptors reported here.

SPARROW HAWK *Accipiter nisus* (L.)

Status: Autumnal passage was suggested by the frequency of October sight records, up to four individuals were seen at one time on several dates. Between November 1961 and March 1962 a pair was present but in the later seasons infrequent single birds only were recorded.

Hunting: Three chases of Fieldfares *Turdus pilaris* L. failed and one was successful. An unsuccessful close chase of a Redwing *Turdus musicus* L. over open dunes was the only occasion when a Sparrow Hawk was seen outside the cover of the pinewoods. This species was flushed from kills three times. Two victims were Mistle Thrushes *Turdus viscivorus* L. and the other a Starling *Sturnus vulgaris* L. All were plucked on the ground in open rides. Reactions to Sparrow Hawks 'hedge-hopping' included finches (Fringillidae) giving alarm calls as they flew to cover. Thrushes (Turdidae) tended to mob. 'Prospecting' flight at tree-top level or a little higher caused less reaction. At rest these hawks were found and mobbed by wandering groups of tits (Paridae).

Pellets: Ten, all from a February 1962 roost in conifers, were collected. Their lengths varied between 25 and 19 mm, diameters between 12 and 8 mm. Contents indicated at least three passerine birds of small size and a mouse *Apodemus* sp.

PEREGRINE FALCON *Falco peregrinus* Tunstall

Status: A frequent visitor, rarely roosting in the study area. Usually seen singly and absent during the prolonged spell of hard weather in 1962-63.

Hunting: Wide-diameter circling preliminary to stoops was observed several times, but the object of the stoop was recognised only three times. These unsuccessful stoops were at Woodpigeon *Columba palumbus* L., Common Snipe *Capella gallinago* (L.) and Fieldfare. Peregrines were disturbed at kills twice; their prey was Woodpigeon and Common Scoter *Melanitta nigra* L., both at edges of slacks (freshwater hollows) in the open dunes. Reactions to this falcon cruising overhead included flying Teal *Anas crecca* L. taking to the water, flying Magpies *Pica pica* L. alighting in shrub cover with alarm calls.

Pellets: Two only (1961), from a tree-stump roost on an island in a flooded slack where one bird was seen to roost on two successive November nights. They measured 52 x 28 mm. and 50 x 24 mm. and contained undetermined downy feathers.

GYR FALCON *Falco rusticolus* L.

Status: A predominantly 'white' bird present much of the winter of 1961-62 was almost certainly not an escaped falconer's bird (M. H. Woodford, *in litt.*)

- Hunting:** Two unsuccessful low stoops after dashes through cover at Magpies were seen; the falcon appearing to give up the chase and gain height before closing the wings. A successful similar low stoop onto a Woodpigeon on the ground followed no response on the part of that bird to alarm calls from a Heron *Ardea cinerea* L. passing over nearby. The remainder of a flock of about twenty Woodpigeons and feral pigeons *Columba livia* Gmelin had plenty of time to reach cover in pines. The Woodpigeon was vigorously trampled on and carried off to open dunes. The Gyr Falcon was never flushed from a kill, although often from open-dune summit roosts 09.00-10.00 and 15.00-16.00 hours G.M.T. Watched at such a roost, from 30-40 metres, the Gyr Falcon was never seen to be mobbed by the Fieldfares, Redwings and Magpies feeding or roosting within a similar distance. In the air, whether cruising at height with very few wing-beats or beating heavily at about tree-top level (10-15 m.) alarm calls were noted only from Magpie and Heron and there was no mobbing.
- Field Characters:** The roosting stance was low, with the body held nearly horizontally. On the ground generally the upright bearing characteristic of the Peregrine Falcon was not evident. Flight was gained rather laboriously with an exaggerated downstroke and slow initial rate of climb, thereafter appearing extremely easy. In the air, the distinctly broader wings and relatively bulkier body with apparently blunter wingtips and more rectangular tail were notable distinctions when compared with the Peregrine. In silhouette at height the bird resembled a soaring Merlin more than any other falcon of my experience.
- Pellets:** Eight pellets were collected in December 1961 and January 1962. Their maximum length was 66 mm, minimum 55, maximum diameter 30 mm and minimum about 20 mm. Six had remains of Rabbit, one included part of the interorbital region of the skull of a Brown Rat *Rattus norvegicus* Berkenhout, and another a few cervical vertebrae closely resembling those of pigeon *Columba* sp.
- MERLIN** *Falco columbarius* L.
- Status:** A regular bird of passage in very small numbers during October. During the winter proper, this species was only an irregular visitor to the study area: roosts were not found within it. Winter-resident at some inland mosslands.
- Hunting:** Two unsuccessful chases of Greenfinch *Chloris chloris* (L.) over dunes and into cover were seen and a Merlin was flushed from its kill once only, when the prey was a Redwing. Evidently tolerated, sitting in cover within 20-30 m. of a favourite passerine feeding area (fruiting Sea-Buckthorn *Hippophae rhamnoides* L. thickets) on three occasions, a Merlin was mobbed as soon as it flew. Fieldfares and Greenfinches would follow and mob a moving Merlin. The bird disturbed at its feeding had been ignored whilst doing so by Redwings and Meadow Pipits *Anthus pratensis* (L.) feeding in the same slack. No pellets were collected.
- KESTREL** *Falco tinnunculus* L.
- Status:** A resident species, augmented at autumn and spring passage and perhaps also to a smaller extent in winter. Two recognisable birds of a 1961 brood were found throughout the study period and during the intervening breeding seasons.
- Hunting:** No successful capture of a vertebrate was observed. Short dashes about the Sea-Buckthorn thickets were unusual for the species but the Kestrel was less persistent than the Sparrowhawk and the Merlin. Most hunting was by hovering-and-dropping; beetles (Coleoptera: Carabidae) were the prey on at least two such occasions. Apart from this the Kestrel was not flushed from a kill, its rather crepuscular habits and my lack of concentration on the species led to its being rarely flushed from roosts. Kestrels hunted open dune grassland and the fringes of adjacent agricultural land, usually away from the main concentrations of passerine birds, but were occasionally mobbed, especially by tits (Paridae) whilst perching on wires or posts.

- Field Characters: There were reminders that any hovering bird should be closely observed and *never* assumed to be this species. During the present study the Gyr Falcon once, and the Merlin several times, hovered head-to-wind, and so did a Red Footed Falcon *Falco vespertinus* L. watched hunting nearby during one of these winters.
- Pellets: Field Voles *Microtus agrestis* (L), Common and Pygmy Shrews *Sorex araneus* L. and *S. minutus* L., a mouse *Apodemus* sp. and beetles (Coleoptera: Carabidae) were represented in pellets.

ACKNOWLEDGEMENTS

R. Wagstaffe of Liverpool Museums and I. Prestt of the Nature Conservancy guided the avifauna survey during which these observations were made. R. J. Donally and the late A. Brown introduced me to the study area, where I was also helped by W. Segar and W. R. Skeels. Other field assistance from A. Baldrige and R. H. Smith is gratefully acknowledged. K. G. Spencer and M. H. Woodford corresponded helpfully, and R. F. Dickens read and criticised in draft.

GLAUCOUS AND ICELAND GULLS IN LANCASHIRE

M. E. & P. A. GREENHALGH

The number of records of both Glaucous and Iceland Gulls (*Larus hyperboreus* and *L. glaucoides*) in Lancashire have increased in the last fifteen years with the result that Oakes' (1953) summary of the status of the two species in Lancashire is out-of-date. One outcome of this is that the editor of the *Lancashire Bird Report*, K. G. Spencer, has begun to summarise the annual records of Glaucous Gulls in the reports. Now that all records are not being published in full, it seems worthwhile producing a new statement as to the status of these species in the county and that is the purpose of this short paper.

GLAUCOUS GULL

Though the first record was on 8 November 1873 at Formby, the second did not occur until December 1922 when one was found at Freshfield. The following year a single bird was recorded from Formby (on 2 January) which may have been the same bird as the last. There was no record from then until 1954 when an immature bird spent part of the winter at Squires Gate. Since then the species has proved to be a regular annual visitor, usually as single birds, in Lancashire.

From checking reports there appears to be a minimum of 42 birds recorded up to the end of 1969 in Lancashire, though there may be a few more. Of these, 2-3 were recorded up to 1950, 5 from 1950-1960 and 35 from 1960-1969. At least a further nine birds were reported in the early months of 1970. There are records for every month though more occur in winter (see table). Many spend long periods in the county, for example a second-year bird remained at Heysham from 30 May to 3 August 1959 whilst several have over-wintered in the Ribble-Mersey area. Immatures predominate at all seasons, the number of aged individuals being 35 immatures and 6 adults (a ratio of almost 6:1) up to 1969.

Most records are from gull roosts, as at Formby Point and Lytham, or on rubbish tips adjacent to the coast where they feed with other gulls, as at Formby, Freckleton, Lytham and Carnforth. However, a few have been reported elsewhere, following fishing boats at Morecambe, or feeding on the open shore. There is also a single inland record, of a bird at Coniston on 13 March 1958.

ICELAND GULL

Although scarcer than the Glaucous Gull, This species can now claim to be an almost annual visitor to Lancashire. From the first record in 1885, when one was recorded from the Duddon Estuary on 24 October, the county had to wait nearly half a century until 1929 for the next, a third-winter bird which spent a month on the Lune at Lancaster. In recent years one or two have turned-up nearly every year, and there are records from all seasons except early autumn (see table). Possibly it requires mid-winter arctic conditions in the breeding areas, the nearest of which is Greenland, to force birds away from these areas before the few reach us. Indeed, most records of both Glaucous and Iceland Gulls occur between December and March when the pack-ice is furthest south. This pattern is especially marked in the latter species.

The monthly distribution of the dated Lancashire records of Glaucous and Iceland Gulls, 1873-1969.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Glaucous Gull	4	6	9	5	3	2	3	3	2	5	3	7
Iceland Gull	2	4	4	3	3	2	1	0	0	1	2	5

As in the Glaucous Gull, most records are of immatures, 14:2 (7:1) of those aged up to the end of 1969. This would imply that it is the immatures which venture furthest afield from the breeding areas, the adults wintering nearer their colonies. Records are from the same areas as Glaucous Gulls, mainly at roosts and tips, and there are two records from inland: at Platt Fields (Manchester) in 1939 and at Audenshaw in April 1969.

With the increase in observers, and the improvement in ability since 1950, many species, thought to be very rare in Oakes' day, have been shown to occur regularly in Lancashire. Examples are numerous: Long-tailed Duck (*Clangula hyemalis*) and Little Gull (*L. minutus*) (Lassey & Greenhalgh 1969) being good examples, as well as the two species dealt with here.

However, as the majority of records of these white-winged gulls is from among large flocks of commoner species, on rubbish tips and at roosts, and a minority of ornithologists appears to search through such flocks, it is probable that many are still not seen and recorded. More careful checks of all gulls would be rewarding in that more could be learnt about, not only our scarcer gulls, but also our commoner ones.

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Hawks, Owls and Wildlife, by John and Frank Craighead. Pp. 443 with 67 plates, 12 figures, 100 tables, and 22 maps. Dover Publications, Inc., New York, 1969. Published in the U.K. by Constable and Co. 36/-.

This is an unabridged Dover edition of the book originally published in 1956. It presents the results of research work by two officers of the Fish and Wildlife Service of the U.S.A. into various hawk and owl species in winter and summer in two differing areas. The techniques for census taking and for establishing the ranges and movements of birds are described. In addition to finding out what food these birds were taking, the populations of the prey species were also worked out. Results suggested that the raptors act as a natural biological control. "Predation is a powerful force tending to establish and maintain equilibrium among animal populations". It will be of no less interest to the mammalogist than to the ornithologist.

The latter will be fascinated to read of the winter populations of Red-tailed, Red-shouldered, American Rough-legged, Sparrow, Cooper's and Marsh Hawks; and of Great Horned, Long-eared, Screech and Short-eared Owls. Additional species come into the studies of nesting raptors.

The tables and maps, as well as the text are a mass of detailed and interesting information. The book should not be dismissed because it does not deal with British species. The techniques and presentation alone make it worthy of careful study.

R.F.D.

Wildlife of Moor and Mountain and Wildlife of Field and Hedgeside by Ian Niall. Both illustrated with line drawings by Lynette Hemmant. Heinemann, 1970. 21/- each.

These two books are likely to have a fairly wide appeal amongst junior readers. They are by no means comprehensive guides to the habitats which form their contents but no doubt have a useful role to play in instructing the young naturalist.

The author's style is easy and pleasant and a good deal of personal observation has gone into his work. This is, to me, where the chief value of these books will emerge; in the encouragement of observation. The illustrations have a casual charm and again may serve as a source of inspiration rather than as identification aids.

One can imagine a young naturalist reading these books and getting considerable pleasure from them though, as experience mounts, the reader will soon outgrow them. This is by no means criticism but an indication of the stage of interest which will be well catered for by these works.

T.M.C.

RENEGADE BADGER IN COUNTY DURHAM

JOHN KNIGHT

Towards the latter part of 1969 there were several reports in the local and national press about a young married man in Co. Durham with a tame badger. The reports stated that the council were considering evicting this man and his family unless he got rid of the animal. Because of this the man was visited in the hope that he would allow the badger to be taken away and prepared for release in a disused sett within the Guisborough area of the North Riding.

From this visit and several subsequent visits it was learnt that the man had bought the badger, a sow, in February or March of 1969 when it was a very small cub 'eight to ten inches in length'. A man in the local village had shot the mother and dug out the three cubs, two of which had died or, as suspected, were killed in rather cruel circumstances. Further details of this affair are very difficult to obtain. By September/October the badger was allowed to roam freely from the house into the neighbouring countryside. At first it returned home every morning but by November its visits were reduced to approximately fortnightly intervals. In the house its behaviour was very like that of a puppy, playing with anything or anyone, especially the two dogs it had been brought up with, and also a strange dog to which it was introduced. It was house trained from a very early age and at no time did it show any aggression.

Since late November it did not return to the house and it was assumed to have fully adapted itself to the wild; however, in early April the author was urgently requested to attempt to catch it. The badger had been visiting certain gardens in the area, raiding dustbins in the early hours of the morning and causing sufficient disturbance to warrant several people to suggest either poisoning it or shooting it.

On Sunday, 5th April, a sett thought to be occupied by this particular badger was visited. The sett had two main entrances, one at the side of a hedge in a field, showing some signs of recent use and the other directly under the hedge. This latter entrance was very well used and by the amount of fresh bedding (hay) outside the sett, the possibility of cubs was thought likely. The dustbin and garden of the house which received the most attention backed onto the field which contained the sett. This field, which had recently been ploughed, showed all the usual signs of badger activity together with clearly defined footprints leading to one of the gardens in question. Although a preliminary watch was kept no sighting of the animal was made. The gardens were apparently left undisturbed until Tuesday, 7th April, when it again raided the dustbin at 1 a.m.

On Friday, 10th April, a garden was watched from a darkened dining room window using a red filtered torch. Shortly after midnight the head of a badger was seen coming in from the field through an opening between the boundary fence and a rabbit hutch containing two, by this time, very agitated rabbits. It wandered around the garden and then entered a partially opened garage where it was successfully shut in.

Initially it showed little fear although it would not come close. It did appear to recognise its name 'Brock' when called out by a woman. (It should be pointed out that it was a woman who was responsible for bottle-feeding it as a cub, hence its interest in a woman's voice.) Conditions for catching it were made doubly difficult since the garage contained a great deal of junk, including a car supported on jacks and two large paraffin storage drums. Because of the lack of success in catching it, its original 'owner' was called out of bed to help. By this time the animal was uttering a continuous low growl with an occasional spluttering cough when it was really annoyed, rather like a motor-bike misfiring.

The badger's 'owner', despite protests, insisted on bringing his dog with him since he was convinced that the dog and badger would recognise each other. This was reluctantly agreed to. Immediately the dog, a cross-bred whippet, approached the badger the anxiety shown earlier disappeared and they both spent some time sniffing each other. It now became possible to stroke the badger's head and back but as expected it was impossible to restrain it fully. During one such attempt the badger got hold of a hand and refused to release it. Although the bite was quite severe it certainly did not use all the power it could have used with its jaws and indeed would have used if it had never come in contact with man as a cub. Eventually after a great struggle it was successfully enclosed in a sack and taken to Guisborough.

It was released in a garage with some temporary bedding and food, and here it fed and drank a little but remained very nervous and agitated. In order to examine

her more fully an injection of acetylpromazine was given intramuscularly. The dosage was greater than that usually given as a tranquiliser, but nevertheless a second injection was necessary thirty minutes later; this second injection made it possible for a cursory examination to be done although the animal was still very much awake. This examination confirmed without doubt that the animal had young. In view of this she was immediately taken back into Co. Durham and released into her sett. Within seconds of her entering the hole the young could be heard suckling.

It was hoped that the rather rough treatment this badger had by necessity received in its capture, would deter it from ever going near to man or man's habitation again. Unfortunately within a week it was again foraging in the garden where it had been caught. Until the young are old enough to fend for themselves no action is planned, unless made absolutely necessary by the attitude of the local residents.

Two interesting factors emerge from this investigation. Firstly confirmation that a badger becomes sexually mature at about seven months old and is capable of producing young within its first year. Secondly that autumnal matings, thought by some authors to be infertile, can be successful.

Doubts arising from this investigation are, can the badger fend for herself fully when in the wild or will she always remain partially dependent upon man for some of her food? Will the cubs be taught by their mother to follow her technique of dustbin foraging or will their behaviour follow the pattern of normal wild badgers?

Termites: A Study in Social Behaviour, by P. E. Howse. Pp. 150 with 4 plates and 25 line drawings. Hutchinson University Library 1970. Hardback, 35/- Paperback, 15s.

It is an intriguing thought that we might know much more about the history of South America if termites had found books and documents less appetising. Such gems of information are scattered liberally through the text of this book and although his main theme is the social behaviour of termites, Dr. Howse manages to put this into a very wide context.

The first chapter is a general introduction to termite biology, while the second and subsequent chapters deal with colony formation, communication, nest building and related topics, with a discussion of the more important ideas and investigations in each case. The final chapter discusses concepts of social behaviour in insects and man and brings out the dangers of trying to explain the organisation of termite colonies in terms of human society. For the general reader there are parts of the book which could be rather heavy going, but for anyone with a particular interest in social insects it can be warmly recommended. It is well produced, with few mistakes, although the reference to Fig. 22 on p. 115 should be to Fig. 23. There is a substantial bibliography and an adequate index.

S.L.S.

Where to Watch Birds in Britain and Europe by John Gooders. Pp 293, with numerous maps and 16 pages of photographs. Andre Deutsch, 1970. 45/-.

Where to Watch Birds, by the same author, has already achieved a wide circulation and listed 500 bird-watching places in Great Britain alone. As he now points out, separate whole books could be written for each of the 27 countries in Europe dealt with alphabetically in this present volume. It will be immediately obvious that it does not contain anything like the coverage of its forerunner. Albania is dismissed in four lines and the one paragraph on Eastern Germany sets out mainly to say that the German Democratic Republic has reluctantly been omitted from the book. With the 27 countries in effect reduced to 25, we now find (inevitably) a wide disparity of information between one and another. Sweden and France top the table, with 19 and 18 sites respectively. Surprisingly Austria (along with Bulgaria and Turkey) has only four bird haunts listed.

Outline maps of each country give the relative positions of the bird-watching places subsequently discussed. More useful are the detailed plans of a number of them, names and addresses of people and organisations whom one can contact, and reference works. For the last, one will need to be a linguist as well as a bird-watcher.

Mr. Gooders' new book will be useful as a first guide when one is planning a European holiday. I hope that it will not tend to kill the spirit of exploration. With the increase in means of access it may serve a useful purpose in channelling the unadventurous to some less vulnerable bird haunts.

R.F.D.

MACROPHYTES OF THE RIVER WEAR

B. A. WHITTON AND R. C. BUCKMASTER

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This paper deals with the distribution in the River Wear of flowering plants, bryophytes and those algae which can be recognised very easily with the naked eye.

A survey of macrophytes in British rivers and of some of the factors influencing their distribution was made by Butcher (1933). Since that date there have been few general accounts, and the vegetation of most rivers remains almost undescribed. Among the rivers of north-east England, the Rivers Tees and Skerne were surveyed in some detail by Butcher *et al.* (1937), and a brief account of the R. Wharfe has been given by Butcher (1933). The flora of the Tees and the Skerne was resurveyed in 1963-1965 by Whitton and Dalpra (1968). They concluded that in spite of considerable chemical changes which have taken place in those rivers since the 1930's there was only one marked change in the flora. This was the apparent invasion of *Enteromorpha*.

When the present survey of the Wear was first considered it was immediately obvious that the Wear differed in at least one marked way from the Tees. Whilst *Ranunculus fluitans* was the most abundant macrophyte in many of the lower reaches of the Tees, it was very rare in the Wear. Further, much local evidence claimed that there had been a great increase in the amount of "weed" in some of the middle and lower reaches of the Wear during approximately the period 1958-1965, in contrast to the situation in the Tees where local reports did not suggest any similar marked increase. It was therefore decided to include, as part of the general survey of the river, a detailed account of the distribution of macrophytes for comparison both with other rivers and in particular with any future changes in the Wear itself.

Recording of macrophytes in a river is complicated by various factors. The distribution varies from year to year. Most species form obvious macrophytic growths only at a certain season of the year. A few species may be represented at some sites only at a particular time of year. The distribution of some species is dependent on the size and frequency of floods in the weeks immediately prior to the survey. The present account records the details of a study carried out along the river during the period July - September 1966, together with general observations made between summer 1965 and autumn 1969. Details are not included of the old mill-race at Bishop Auckland, which was closed on 31st October, 1966.

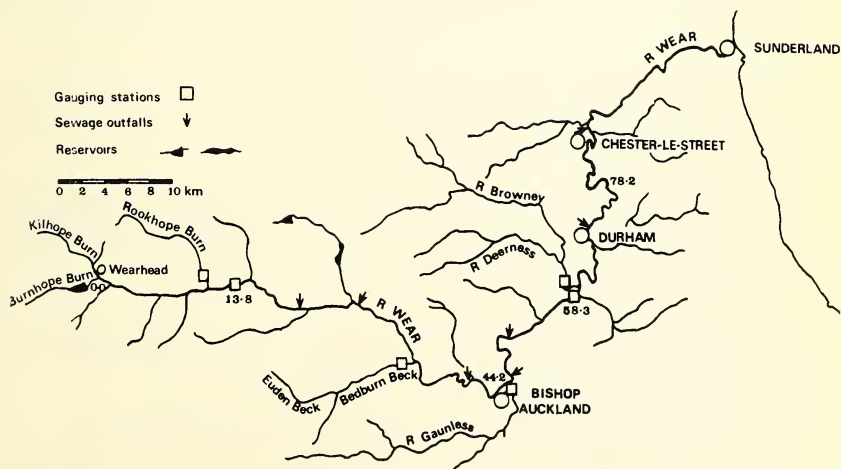


Fig. 1 Map of the River Wear showing main tributaries, distances from Wearhead and important (1966) sewage effluents.

AVAILABLE DATA ON THE RIVER

There is some data on the Wear in the literature. Certain thermal characteristics are included in Smith (1968), and general information on hydrology and chemistry is available in the annual reports of the Wear and Tees River Board. Several useful reviews will be included in the British Association 1970 Survey, particularly on climate (Smith) and hydrology (Cairney and Storey). An account of the diatoms has been given by Peabody and Whitton (1966). Detailed accounts of some aspects of the chemistry and biology will be published later as part of the current survey of the river. The following is a very brief summary of certain physical and chemical factors likely to influence the distribution of macrophytes.

The Wear is formed at Wearhead by the junction of two moderate-sized streams, Burnhope Burn and Kilhope Burn. It runs 106.9 km from Wearhead to Wearmouth Bridge, Sunderland (Fig. 1). The river is 336 m above sea-level at Wearhead, and the rate of fall (and hence speed of current) decreases gradually from source to mouth (Fig. 2). There is no upland slow-flowing reach like the (now submerged) Weel of the Tees, nor any large waterfall. In spite of the fact that several upland reservoirs release compensation water, the river is still subject to very marked changes in flow and occasionally to very severe flooding. In a survey of local literature on the history of the river, Mr. D. Richardson (personal communication) concluded that major floods have occurred at all seasons of the year (Fig. 3). During the present study three floods occurred during the winter 1967-68, two of which were among the most severe ever known to the present river-bailiff, Mr. S. Pepper. The river is tidal up to approximately km 91.5.

In general, the chemistry of the river relevant to macrophytes may be considered as a gradual increase in nutrient levels while passing from Wearhead to Sunderland. The most important sewage outflows operating in 1966 are indicated in Fig. 1. Most effluents into the main river are in quite good condition and there are only minor growths of sewage-fungus. (Some tributaries, however, do develop considerable growths of sewage-fungus). Perhaps the most marked discontinuities in the river are brought about by the effluent from Wadsworth sewage disposal works (km 39.6), and by the inflow of the R. Gaunless which brings to the main river a considerable rise in hardness of the water. A few representative analyses (M. Snow, personal communication) are listed in Table I. They are taken from a detailed survey carried out on 14th November 1967. Flow data for this were kindly supplied by the Northumbrian River Authority. Values for Wearhead (1130 hours) and Witton-le-Bridge (1540 hours) were based on current meter readings, that for Stanhope was an estimate, while that for Sunderland Bridge was the mean discharge value from the permanent gauging station.

Even during the period of survey there have been various improvements and changes in the sewage effluents entering the river. The most important was the opening of a large works at Brotherlee in winter 1968-1969, entering the river at km 7.4. This works takes most of the sewage from the valley above this point, and most minor organic effluents in this region have now ceased.

There are many old mines in the upland drainage area, and several of these have recently been re-opened. Detailed maps of the distribution of trace metals in streams are not yet available, but it seems probable that several (*e.g.* Kilhope Burn, Rookhope Burn) carry levels of Zn and Pb sufficient to have marked biological effects in these streams and locally possibly also slight ones on the main river.

Until recent years the river suffered considerably from various effluents associated with coal-mining and coke works. These effluents were responsible for very high levels of suspended matter in the water. Most were stopped in the period 1955-1966, and obvious effects of mine waters on the main river are now only minor.

During the period of the survey it was not obvious that any industrial chemical effluent had a marked effect on the ecology of the main river. However movements of gravel and silt associated with gravel-workings, open-cast mining and some building operations did have at least temporary effects on plant growth. The most important was the total diversion of a stretch of river below Chester-le-Street associated with the building of the new Lambton Bridge.

METHODS

The basic survey was carried out by recording the presence or absence of macrophytic species along 0.5 km lengths of the river. The present study was extended into the tidal limit only as far as the limit of growth of macrophytes other than algae (km 96.5-97.0). The presence or absence of species was recorded whilst wading or boating along the river. Obviously there was always a possibility of certain species being overlooked in a particular length, but at least a record of absence indicates that the species was very rare. The river was suitable for wading on about one day in two during summer, and about 2 km could be surveyed thoroughly in one day.

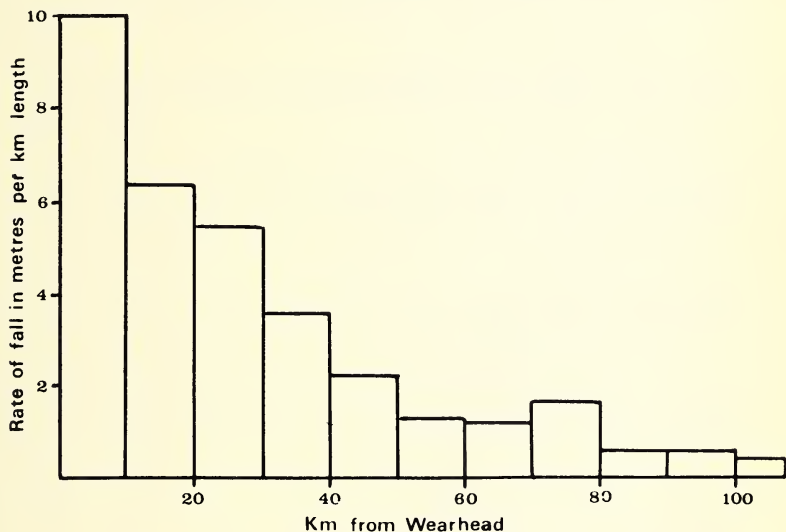


Fig. 2 Average rate of fall in height of river for each 10 km length of river. Rate of fall is expressed in metres vertical drop/kilometre horizontal distance.

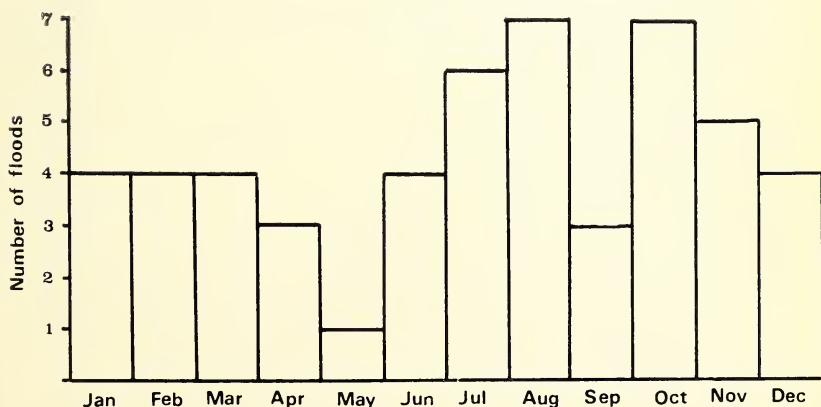


Fig. 3 Histogram showing number of major floods indicated in the literature for each month of the year in the period 1648-1939.

Km. from Wearhead	Sampling Site	Stream Flow l/sec	Na mg/l	K mg/l	Mg mg/l	Ca mg/l	Cl mg/l	Si mg/l	NO ₃ -N mg/l	PO ₄ -P mg/l
0.0	Wearhead	169.9	3.8	1.3	6.0	30.4	6.1	0.70	0.08	<0.015
13.8	Stanhope	1415.9	5.0	1.4	6.5	35.2	9.8	1.45	0.22	<0.015
24.2	Wolsingham	3049.7	6.7	1.9	8.2	36.0	12.8		0.28	<0.015
35.2	Witton-le-Wear Bridge	3049.7	6.3	1.6	6.0	34.0	13.6	2.01	0.57	0.049
	Willington,									
51.0	Jubilee Bridge		17.1	3.7	43.8	55.0	17.3	2.57	1.37	0.101
54.1	Page Bank		16.2	3.4	42.5	53.8	18.3	2.59	1.66	0.153
	Sunderland									
58.3	Bridge	4615.7	27.5	4.5	34.5	62.6	20.7	2.69	1.80	0.108
65.4	Shincliffe Bridge		37.8	5.0	42.0	64.4	31.2	2.90	>2.5	0.106
80.7	Cocken Bridge		35.8	4.9	47.5	67.8	30.1	2.85	>2.5	0.134
92.1	Lamb Bridge		82.0	7.3	71.0	77.2	70.8	3.22	>2.5	0.248
(0.0)	Burnhope Burn		2.3	0.6	1.7	13.4	5.7	0.14	0.57	<0.015
(0.0)	Kilhope Burn		4.4	1.6	9.2	35.8	7.7	1.42	0.15	<0.015
(10.6)	Rookhope Burn	132.8	4.0	1.5	6.5	23.6	6.3	2.08	0.050	<0.015
(44.1)	R. Gaunless	652.9	61.0	8.0	12.2	92.0	26.0	4.34	2.25	<0.015
(59.3)	R. Browney	271.8	51.0	7.2	60.0	62.6	33.5	4.09	>2.5	0.176
	Lumley Park									
(88.2)	Burn		570	19.0	165	151	576	5.18	>2.5	1.60
(88.6)	Cong Burn		185	9.0	148	101	70.8	3.43	1.82	0.068

TABLE I—Some important chemical features of the River Wear and major tributaries taken from a detailed survey on 14 February 1967 under conditions of moderately low flow

RESULTS

The detailed distribution of species along the 0.5 km lengths during summer 1966 is given in Table II, whilst the results are summarized in Fig. 4. A general account of each species is given below. This account includes certain macrophytes not listed in the tables, the two most important of which are the algae *Lemanea* and *Vaucheria*. *Lemanea fluviatilis* is most obvious in the spring, and records made in late summer would give a marked underestimate of its abundance. *Vaucheria sessilis* is generally most abundant in late summer, but due to its growth form the recording of presence or absence is especially sensitive to the thoroughness with which an area is studied. Species found in tributaries but not in the main river are not dealt with here; these included bryophytes, but no angiosperms.

ALGAE

Lemanea fluviatilis Ag.

All *Lemanea* forms from the main river were referred provisionally to this species, although Butcher *et al.* (1937) separated the forms in the Tees into *L. fluviatilis* and *L. mamillosa* Kütz.

The blue-olive adult plants of *Lemanea* were the most abundant macrophytes in the upper reaches of the river from February to May, and were still frequent in June. Some adult plants usually persisted until the next autumn, although were largely if not entirely dead by that time. *Lemanea* was relatively free of epiphytes during its main growing season, in winter and early spring, but often became smothered by May. Any adult plants remaining until the autumn were always smothered then. The alga was recorded downstream as far as km 80.6, but dense coverings were frequent only in the uppermost 25 km. Its distribution thus fits in well with the conclusion of Fjerdingsstad (1965) that it is a saproxenous species. The individual plants present in summer in the middle reaches were at least as large as those in the upper reaches, indicating that the reason for fewer plants here is probably not a direct effect of changes in water chemistry. It seems reasonable to speculate that one of the main factors limiting *Lemanea* populations in the middle and lower reaches may be the lack of competitive ability here of the chantransia filaments with the September and October growths of *Cladophora* and diatoms on boulders in fast-flowing currents.

The adult plants grow on sheets of rock or large boulders. On some rock slabs in the upper reaches during late winter and spring *Lemanea* was the only macrophyte present; on others, such as some of the rock faces at Wearhead, the *Lemanea* was in late spring replaced as the dominant by moss. Microscopic inspection of pieces of moss during September and October frequently showed the presence of the chantransia stage of *Lemanea* mixed up with the moss. The chantransia stage also showed as obvious reddish growths on rocks.

Rather more detailed observations were made on the chantransia in one of the tributaries, Euden Beck (O.S. 062300). In September the first growths appear pink microscopically. Later the colour turns a rust-red. In culture such rust-red filaments eventually turn brown. The adult plants are blue-olive during the growing season, becoming a dull olive in summer.

The time at which the chantransia develops into the adult plant varies somewhat from site to site. It was noted that the chantransia was more persistent at the wooded Euden Beck site than at an open site on a small tributary of Bedburn Beck (O. S. 086311).

Vaucheria sessilis de Candolle

The alga taken directly from the river was not found with sex organs, but material brought into the laboratory on several occasions (*e.g.* June 1969 from Finchale, km 78.2) did develop them. There was considerable variation in growth form and filament width, but at least in the non-brackish reaches of the main river *Vaucheria* can probably all be referred to *V. sessilis*.

Vaucheria was a not uncommon plant from km 43 downstream, and sometimes became the most abundant in the river for short stretches. The alga can show obvious growth at all seasons. The exact time at which it became most abundant at a site was variable, but in general it was developed best in late summer. The largest populations were developed in relatively shallow reaches with a moderate rate of flow, after periods when the river had been low for several weeks. Possibly the presence of late summer peaks is mainly a reflection of the facts that river flow conditions tend to be relatively low and that competition with *Cladophora* is less severe at this season. Backhaus (1968), in his account of the upper Danube and its tributaries, noted that at one station a *Vaucheria* maximum appeared in September after *Stigeoclonium tenue*, but at others there was no marked maximum, though the largest amounts were present in autumn.

In non-tidal reaches the alga grows on slabs and large rocks. Especially in the faster-flowing reaches it forms carpets, but under slower flow conditions it sometimes produces long filaments. These filaments can reach 250 mm in length if mixed up with *Cladophora*. Although the largest growths were developed under moderate flow conditions, it tolerates very fast currents. However it is detached in floods rather more easily than *Cladophora*. The ease with which this detachment can occur depends on conditions during growth. The form with large cushions including much silt is more easily detached than that with long filaments trailing in the current.

In the tidal reaches *Vaucheria* grows on the banks exposed for part of the tidal cycle. In this habitat it is extremely resistant to various pollutants, and in the Tees occurs abundantly on muds covered at high tide by waters whose oxygen concentration may drop below 10% saturation.

Enteromorpha flexuosa ssp. pilifera (Kütz.) Bliding

In late summer this alga was common after periods of low flow towards the sides of the river in the lower reaches, and occasionally in the middle reaches. Its occurrence was sparse in 1966, so its general distribution is not included in Table II. It was however much more common in the summers of 1967-1969, particularly 1969. In 1969 the furthest upstream record was in km 37.0-37.5; occasional plants occurred entangled with submerged angiosperms in slow-flowing reaches from here downstream, and the alga became locally abundant in shallow reaches at the side of the river at various sites e.g. Finchale (km 78.1) and Chester-le-Street (km 88.3).

Cladophora glomerata L.

See Table II and Fig 4. *Cladophora* is in summer one of the most abundant plants in the river, but its detailed distribution as a macrophyte is especially dependent on river flow conditions. In summer 1966 it was present at the bottom of Elmford Cleugh (km 1.1), but did not occur in the main river higher than Bridge End (km 4.4). In this summer there were only 4 other records of obvious macrophytic growths in the river above km 22.5. From here downstream it was present in the great majority of 0.5 km lengths, although very large growths of the alga developed only below Bishop Auckland (i.e. below the entry of the Wadsworth sewage works at km 39.6 and the Gaunless at 44.1).

The general distribution of *Cladophora* was similar in the summer of 1967-1969. Below Bishop Auckland the alga at times formed large growths wherever the river was shallow but fast-flowing, although no growths were seen quite as dramatic as those described from the Tees below the entry of the Skerne by Butcher *et al.* (1937), and which were still present during the 1960's. The exact times of year at which the most conspicuous growths occurred varied from site to site and from year to year. In early summer 1969 the growths were at most sites less than at a similar time in the previous years. This was presumably due to the long spell of poor weather in spring 1969. On the other hand in August 1969 the growths of *Cladophora* at Frosterley (km 19.2) were much larger than seen in previous years, with individual plants reaching 300-400 mm length.

The near absence of *Cladophora* in the upper reaches of the river is no doubt largely associated with the fact that nitrate and phosphate concentrations are relatively low (Table I.) However considerable growths of *Stigeoclonium tenue* and other green algae sometimes develop in these reaches, so the possibility can not be ruled out that heavy metals sometimes here reach levels inhibitory to *Cladophora*, which is especially sensitive to them (Whitton, 1967).

Heavy metal poisoning is certainly a strong possibility for explaining the complete absence of *Cladophora* in the Rookhope Burn. *Cladophora* attached to rocks was on several occasions transplanted into a stretch of this stream with abundant *Stigeoclonium*. Within 4-5 days the alga became markedly unhealthy. Microscopic inspection always showed that the cells in the apical region had started but not completed a cell division. Such an appearance corresponds with symptoms of Pb toxicity noted in laboratory cultures. No symptoms of Zn toxicity were noted in material transplanted to the Rookhope Burn.

Some further data on *Cladophora* in the Wear is included in Whitton (1967).

BRYOPHYTES*Fissidens crassipes* Wils.

This species is characteristic of the lower river. In summer 1966, for instance, it was not recorded above km 60.0-60.5, was frequent below Durham (km 69.0) and sometimes abundant below Chester-le-Street (km 86.0). In general this moss was most obvious during late summer. Observation at Finchale (km 78.2) during 1967-68 showed that some plants did over-winter as obvious macrophytic growths, but the percentage cover of the species showed a very marked reduction by early spring.

F. crassipes frequently occurs mixed with *Eurhynchium riparioides*, but nearly pure lawns of *Fissidens* usually occur at a water level higher than that suited for *Eurhynchium*. Numerous very small plants of *Fissidens* occur during late summer on large rocks in the upper part of the tidal reach. In general *Fissidens* appears to withstand more frequent exposure than *Eurhynchium*, and possibly also is more tolerant of lower light intensities.

Cinclidotus fontinaloides (Hedw.) P. Beauv.

This species was found only at Stanhope gauging station (km 13.8) and at Finchale Abbey (km 78.2). At the latter site it occurred on a boulder frequently above water level, and was thus in a dried up state for over half the time. Butcher *et al.* (1937) reported that this species was rare in the Tees above Croft. In contrast, Watson (1955) states that it is common on rock and wood in streams and rivers, both in lowland and hilly districts.

Fontinalis antipyretica Hedw.

See Table II and Fig. 4 This moss occurs on semi-permanent rocks and wooden pilings throughout almost the whole river from km 18.0-18.5 downstream. The two records above this, at km 0.0 and km 13.0 refer to a few plants in the main river immediately below streams where *Fontinalis* is locally abundant. The moss is most abundant in the middle reaches of the river and occurs in rather similar habitats to *Cladophora*. As compared with *Cladophora* it is slightly more tolerant of shade and occurs most abundantly in slightly deeper, more slow-flowing water.

In comparison with the size of the plant, this moss has only a very small area of attachment, and possibly as a result many specimens show considerable damage. Colonization is probably a result of fragmentation of the parent plant during high water conditions. It was quite frequently observed that fragments had become lodged on or in projections from the river bed and then subsequently attached to them. Like *Eurhynchium*, *Fontinalis* plants often look mutilated in the lower reaches in late summer where they occur on rock surfaces occasionally exposed above the water level, but not where the plants occur in the main current. Jones (1952-1955) reported that in Berkshire and Oxfordshire under conditions where *F. antipyretica* was left uncovered in summer by the water level falling, capsules were formed rarely. However none were seen in the Wear.

Smith (1964) reported that *Fontinalis antipyretica* was frequent in Glamorgan on rocks and stones in unpolluted pools, streams and rivers. Such a distribution would seem to contrast with the behaviour of the moss in the Wear, where it was almost absent in the upper reaches and most abundant in the middle reaches where the river has considerable nutrient enrichment. The interpretation of this apparent difference possibly lies in the subjectivity of the term "pollution". Benson-Evans (personal communication) reports that this species is quite tolerant to organic enrichment in the Cynon, Taff and other rivers of South Wales, where flow rates are fairly rapid.

Leptodictyum riparium (Hedw.) Warnst.

This species was found only in the lower river, becoming most abundant in shallow reaches near Chester-le-Street. As a macrophyte in the river it is almost exclusively a summer species, though it was recorded in winter on wooden pilings in slower reaches near Durham.

Hygroamblystegium fluviatile (Hedw.) Loeske

This species is easily under-recorded when growing in a stretch among *Eurhynchium*. Butcher *et al.* (1937) reported that it had been found throughout the Tees, but

no records were made in the Wear above Bishop Auckland. This moss is sometimes frequent in summer, as at Finchale Abbey (km 78.2). It appears less tolerant of occasional exposure than *Eurhynchium*.

Drepanocladus aduncus (Hedw.) Warnst.

See Table II and Fig. 4. This moss was limited to km 0.0-km 2.5 in the main river, but is in many of the upland tributaries. *Drepanocladus aduncus* seems to have a greater ability to withstand fast currents than *Eurhynchium* and is found in the middle of the river at Wearhead. However it is not found exclusively on sheets of rock and boulders, but also occurs on loose pebbles and gravel, and its own growth habit is sometimes responsible for trapping further gravel and silt. The fact that it is not restricted to fixed substrata like *Eurhynchium* and *Fontinalis* is probably due to colonization resulting mostly from sexually produced spores. Capsules were frequent during winter, and many small plants were found on the larger loose rocks in spring and summer in the reaches near where the moss occurs.

Eurhynchium riparioides (Hedw.) Jennings

See Table II and Fig. 4. This has the widest distribution of any macrophyte in the river. It occurs on sheets of rock and large boulders that are usually submerged. When several mosses occur at the same site, the *Eurhynchium* usually occupies the lower zone. However it can apparently not tolerate extremely fast currents. At Wearhead and in the headwaters it occurs at the edge of the stream, whereas in the lower reaches it also occurs on permanent rocks in midstream.

The species is autococious and according to Watson (1955) the capsule is not uncommon. Paton (1961) considers the capsules uncommon. In the Wear capsules were seldom seen, and then usually in the headwaters. The plant is perennial and the suggestion has been made that recolonization results from detachment of fragments from the main plant which collect in crevices of the stream bed. Certainly small plantlets were found growing within fronds of *Cladophora* during the summer months.

The surface of rock covered by this species is reduced during the winter, and this is possibly due to the formation of large blocks of ice on the larger stones during low-flow, cold-weather conditions. Subsequent mild weather brings about a rise in river level and detachment of the ice block, thereby sometimes removing plant material.

In mid and late summer it is easy to underestimate its cover in the lower reaches as here the great majority of leaves are often shed from the stems at this season. This tendency to lose leaves is much less marked in the upper reaches. The greater loss of leaves in the lower reaches is probably at least partly due to the greater tendency here for the moss to be shaded by growths of filamentous algae.

Scapania undulata (L.) Dum.

This species was found only as the form with entire leaf margins. In the main river it was recorded only at Wearhead. In some tributaries it is not uncommon on sites subject to frequent desiccation. It was found mainly on stones, but sometimes also growing over gravel. It seems possible that the population at Wearhead is maintained mainly by repeated inoculation from the tributaries.

Jungermannia tristis Nees

This species was found in the main river only at Willington (km 51.1) growing over silt under low-flow conditions.

ANGIOSPERMS

Ranunculus fluitans Lam.

See Table II and Fig. 4. All plants of *Ranunculus* found in the Wear lacked any floating leaves. This resembles the situation in the Tees, but differs from that in the R. Eden, a fast flowing river draining the other side of the Pennine watershed. Using the description of *Ranunculus* subgenus *Batrachium* given in Cook (1966), all *Ranunculus* found in the Wear was referred to *R. fluitans* Lam. This is based on the fact that the receptacle is at most only sparsely pubescent, rather than densely pubescent as in *R. penicillatus* var. *calcareus* (R. W. Butcher) C.D.K. Cook.

In view of the great difference in abundance of *R. fluitans* between the Wear and the Tees, as mentioned earlier, the known history of this species in the Wear will be given in some detail. Much of the information has been given by Mr. S. Pepper. It seems uncertain whether *R. fluitans* occurred at all in the Wear prior to 1959. In that year Pepper transferred a bin-full from the Tees (? below Middleton-St.-George) to the Wear. An attempt was made to plant material just above Wolsingham (km 24.3),

and a few plants were simply thrown in the river at Frosterley (km 19.2). Apparently none of the plants took root at Wolsingham, but since that time there have always been one or more plants at Frosterley. In 1960-69 there was a single large plant here which flowered freely each year.

By 1965 plants were seen at a few sites down the river: Stanhope, several sites below Bishop Auckland, possibly near Chester-Le-Street. A plant was seen in the old mill-race at Bishop Auckland for the first time in 1966. Several other sites where it was present in 1966 are indicated in Table II. In 1967 it was present at Durham Sands (km 70.4). However in 1968 the population in the whole river was much reduced – from over 30 plants in 1967 to less than 10 in 1968. In the stretch below Bishop Auckland there were only two small plants remaining. There was however one certain record at Chester-le-Street (km 88.5). During the same winter 1967-68, there was a great reduction in abundance of *R. fluitans* in the Tees. It therefore seems very probable that the exceptional floods during that winter mentioned earlier were responsible in both rivers for the reduction in populations, although the absolute amounts of the populations were of course very different.

The water-buttermcup is a popular plant due to its attractive flowers, and the fact that it provides an excellent habitat for many of the insect larvae fed on by fish (Derrick, 1969). Anglers would certainly welcome its growth in preference to any other macrophyte. It therefore seems worth speculating about the rarity of this plant in the Wear in order to predict whether or not it is likely to increase in abundance, and whether there is anything which could be done to encourage its spread.

A major difference between the middle and lower Wear as compared with the Tees is the extent of pollution up to the mid-1950's by wastes from the coal and coke industries in the Wear, whereas such wastes were much less important in the Tees. It seems plausible to suggest that even if large populations of *R. fluitans* did once occur in the Wear, this species would have been selectively at a disadvantage as compared with other macrophytes. Cook (1966) states that it is a species fairly tolerant of pollution as long as the water remains clear. If the water becomes cloudy or shaded it soon dies. It could be suggested that the fact that its rate of spread between 1959 and 1967 was only moderate was due simply to the small inoculum of seeds and macrophytic fragments in the river. The apparent sensitivity of the species to the floods of 1967-68 is surprising in view of the fact that although the species is much more abundant in the Tees below Croft than in the Wear, nevertheless the Tees is a river somewhat more subject to severe floods than even the Wear. Presumably floods with such severe effects as these must be rare, as otherwise *R. fluitans* would never have become one of the four most common macrophytes in this stretch of Tees. One possible explanation is that the last flood occurred on 28th March 1968, and *R. fluitans*, which commences obvious growth earlier in the season than other species like *Potamogeton pectinatus* var. *interruptus*, would be selectively sensitive to flood damage at this season.

The data presented here do not quite fit in with those given in Cook (1966). Cook indicates that *R. fluitans* is a species more characteristic of stable rivers as compared with *R. penicillatus* which is more characteristic of unstable rivers. Cook reported that individual plants of *R. fluitans* which had been watched for three years at two sites retained almost the same shape and size without any change in position, in contrast to observations made on *R. fluitans* × *aquatilis* and *R. penicillatus* var. *calcareus*. In the Wear one plant of *R. fluitans* did retain its shape for the four years of observations, but observations elsewhere in the Wear and Tees indicate that this is not generally true. Quadrats illustrated by Butcher *et al.* (1937) for the Tees from 1930-1932, and unpublished quadrats of Dalpra and Whitton for the same river from 1964-1965 indicate that *R. fluitans* here may change its shape, size and position quite rapidly.

Myriophyllum spicatum L.

See Table II. In years subsequent to the 1966 survey occasional small plants were found elsewhere in the river, but seldom survived two seasons. This species is one of the most abundant in lowland ponds in Co. Durham, so the few plants in the river may largely result from repeated re-inoculation from ponds.

Polygonum amphibium L.

See Table II and Fig. 4. This occurs only in slow-flowing water at the edge of the river, and usually at the same site it extends up the bank in its terrestrial form. At some sites it forms a narrow fringe immediately outside *Sparganium ramosum* and inside *Potamogeton natans*.

Elodea canadensis Michx.

See Table II and Fig. 4. This species was most abundant near Bishop Auckland, and at least one site just above Newton Cap Bridge (km 43.0) was present each year from 1966-1969. It was never found in flower in the river, in contrast to its behaviour in some local ponds where it was found flowering abundantly in late summer 1969.

Lemna minor L.

More than any other angiosperm the distribution of *Lemna minor* is dependent on flow conditions in the river. In summer 1966 the highest upstream record was at km 40.0-40.5, but during late summer low flow periods occasional plants have occurred upstream from here. Dense covers of this species sometimes occurred in late summer at one side of the river at various sites *e.g.* above Framwellgate Weir, Durham (km 69.6).

Eleocharis palustris (L.) R. Br. emend. Roem. & Schult.

See Table II and Fig. 4. In the middle reaches this species occasionally forms a fringe along one side of the river.

Sparganium ramosum Huds. ssp. *ramosum*

See Table II and Fig. 4. This species occurs as an intermittent fringe along many of the lower reaches. Its distribution along the river, illustrated in Fig. 4, is bimodal. It can be seen from Fig. 2 that there is no sudden rapid rate of fall in the height of the river in the km 60.0-70.0 stretch. The anomalous behaviour is simply a result of the steep and often shaded banks near Durham City.

Schoenoplectus lacustris (L.) Palla

See Table II.

Potamogeton perfoliatus L.

See Table II and Fig. 4. This species usually occurs in relatively slow-flowing conditions. Its habitat in the river tends to overlap with those of the other *Potamogeton* spp. When present in the same reach as *P. natans*, *P. perfoliatus* grows on the outer edge of the *P. natans* bed. On the other hand when growing in the same reach as *P. pectinatus* var. *interruptus*, *P. perfoliatus* is relatively more successful towards the edge of the river.

From the general observations made it is not entirely clear how the environmental requirements of *P. perfoliatus* differ from those of *P. crispus*. *P. perfoliatus* grows at greater depths in the river than *P. crispus*, and is also somewhat more tolerant of shading by trees along the river bank. *P. perfoliatus* was usually found in large beds, whereas *P. crispus* occurred both as quite large beds and numerous isolated plants. Although *P. crispus* grows best on the silted edges of stretches of river which are moderately fast flowing in the middle, fragments are also found growing in small silt patches among pebbles. Probably *P. crispus* is much more tolerant of occasional disturbance of the river bed by floods.

Of all the species in the river, *P. perfoliatus* has probably made a relatively greater increase than any other during recent years. Observation by the authors has certainly confirmed a marked increase during the 1960's in the size of *P. perfoliatus* beds near Durham.

P. crispus L.

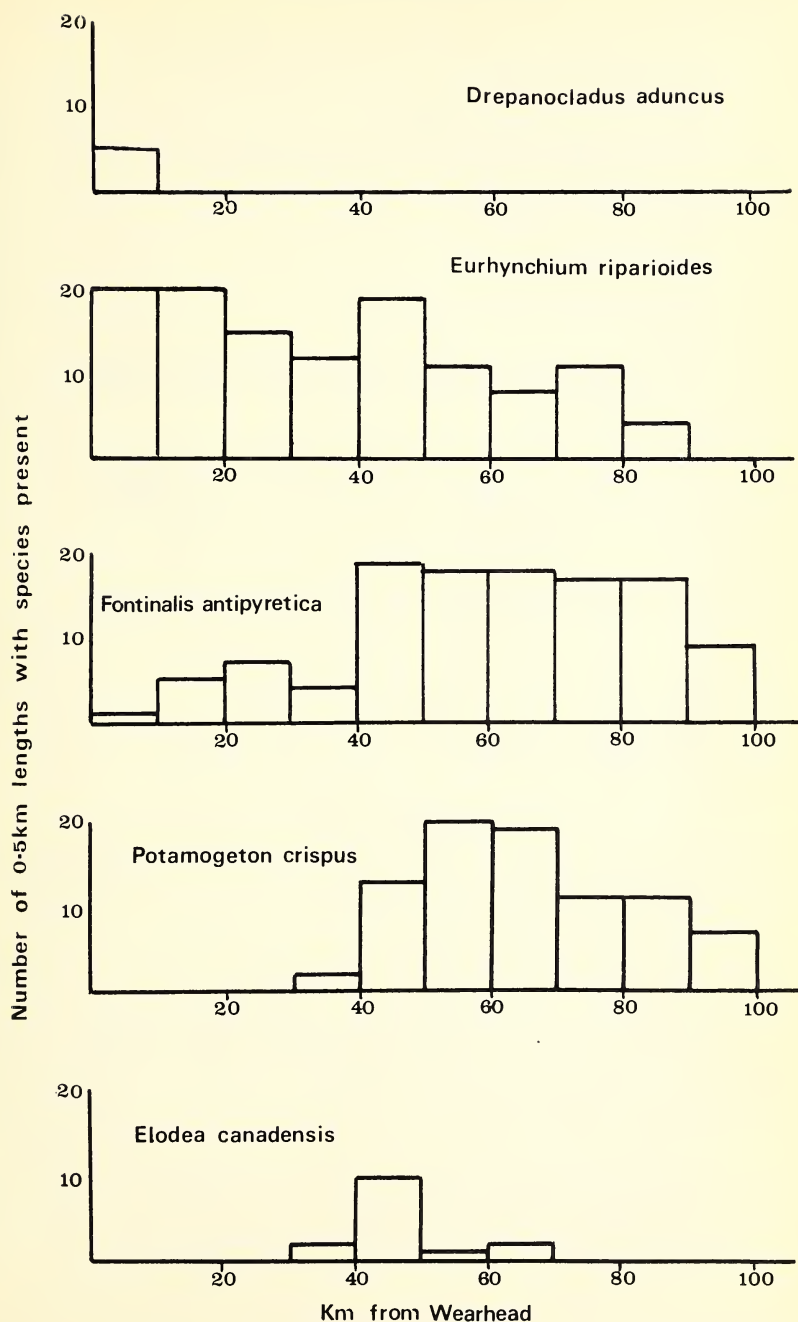
See Table II, and Fig. 4, and the discussion under *P. perfoliatus*. This species has an especially long growing season, and the leaves appear quite healthy right through autumn until the first major flood.

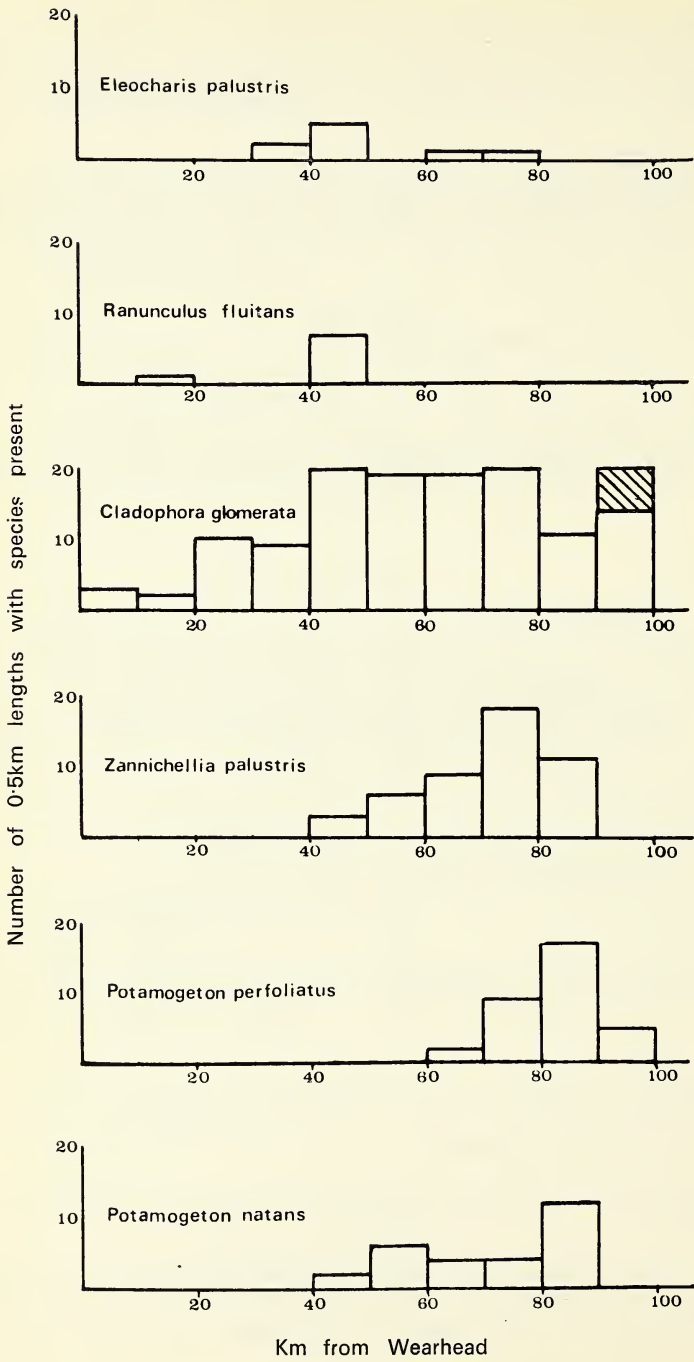
Potamogeton natans L.

See Table II, Fig. 4 and the discussion under *P. perfoliatus*. The leaves and stipules of this species already appear senescent in September.

P. pectinatus L. var. *interruptus* (Kit.) Aschers.

See Table II, Fig. 4 and the discussion under *P. perfoliatus*. This is a species of the lower reaches, and occupies sites of medium to fast current. It is very tolerant of pollution from sewage outflows. Although the bed of the plant at Finchale (km 77.8)





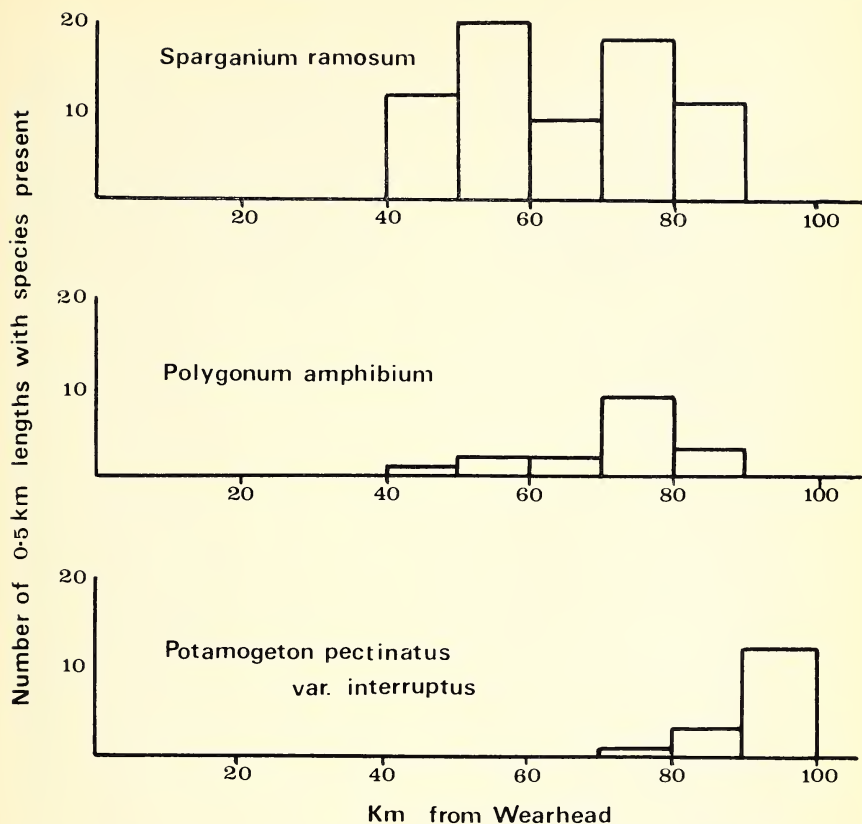


Fig. 4 Distribution of certain macrophytes in R. Wear. Data summarizes presence or absence of species in 0.5 km lengths of the river; the order in which the species are presented gives some indication of the reaches of the river where a particular species is most abundant as compared with the other macrophytes.

occurred over 6 km higher upstream than the next record, nevertheless it was found at this site each summer from 1966 to 1969.

In the faster-flowing reaches at Chester-le-Street this species has increased in abundance greatly during the 1960's, presumably due to the decrease in turbidity of the water. It colonized in 1968 and 1969 rapidly areas of the new river bed resulting from the diversion mentioned earlier. However local information indicates that there has been no marked increase in its abundance during the 1960's in the Lambton Park reaches, which are deeper, more slow-flowing and with a greater tendency to be shaded from large trees along the bank.

Especially under conditions of medium flow, this species traps large amounts of silt and gravel among its stems, and at least temporarily can cause marked changes in the pattern of river flow at a particular site. Probably the River Authority will eventually need to cut away each August much of this plant from medium and fast-flowing reaches below Chester-le-Street, if the passage of fish is not to be severely hindered.

Zannichellia palustris L.

See Table II and Fig. 4. Although this species is easily overlooked unless occurring as a bed, it does appear to be absent below km 83.8, and only present in any abundance near Durham. It occurs in shallow, silted reaches.

Km	Name of Length	<i>Cladophora glomerata</i>	<i>Fontinalis antipyretica</i>	<i>Drepanocladus aduncus</i>	<i>Eurhynchium riparioides</i>	<i>Ranunculus fluitans</i>	<i>Myriophyllum spicatum</i>	<i>Polygonum amphibium</i>	<i>Elodea canadensis</i>	<i>Eleocharis palustris</i>	<i>Sparganium ramosum</i>	<i>Schoenoplectus lacustris</i>	<i>Potamogeton perfoliatus</i>	<i>Potamogeton crispus</i>	<i>Potamogeton natans</i>	<i>Potamogeton pectinatus</i>	<i>Zannichellia palustris</i>
24.5	Wolsingham		+	+													
25.0	Wolsingham Steel Works	+		+													
25.5	Wiserley Hall	+		+													
26.0	Scotch Isle			+													
26.5	Crook Lane	+		+													
27.0	Gallows Gate	+															
27.5	Bradley																
28.0	Bradley Hall																
28.5	Eels Beck	+															
29.0	Dove Sike																
29.5	Bracken Hill	+		+													
30.0	Low Shipley				+												
30.5	Harperley Dene																
31.0	North Carr Wood																
31.5	Ciscorn Bank	+		+													
32.0	Bedburn Beck	+		+													
32.5	McNeil Wood																
33.0	The Sear				+												
33.5	Witton Bottoms				+												
34.0	Lane House																
34.5	Crakehill Bank	+															
35.0	Witton Bridge				+												
35.5	Witton Ford	+		+													
36.0	Plumtree Hall																
36.5	Witton Sewage Works				+												
37.0	Witton Nature Reserve	+															
37.5	Slotburn Bridge																
38.0	Witton Old Viaduct	++	+	+				++							+		
38.5	Paradise Cottage	++	+	+													
39.0	Witton Park	++	+	+				++							+		
39.5	Beechburn Beck	++	+	+													
40.0	Toronto Inn	++	+	+		+		+									
40.5	Escomb	++	+	+													
41.0	Toronto	++	+	+				+							+		
41.5	Etherley Dene	+						+									
42.0	Broken Bank Weir	++	++	+				+							+		
42.5	Newton Cap Gardens	++	+	+				++							+		
43.0	Newton Cap Bridge	++	+	+				++							+		
43.5	Auckland Castle	++	++	+				++							+		
44.0	Jock's Bridge	++	++	+											+		
44.5	Vinovia	++	++	+				+	+						+		
45.0	Binchester	++	+	+											+		
45.5	Binchester Sewage Works	++	+	+					++								
46.0	Birtley Cottages	++	+	+				+							+		+
46.5	Bellburn Wood	++	+	+				+	+						+		
47.0	Binchester Crage Farm	++	+	+					+						+		+
47.5	Newfield Quarry	++	+	+					+						+		+
48.0	Half Moon Plantation	++	+	+				+	+					++	++		
48.5	The Challies	++	++	+			+		+					++	++		

Km Name of Length

	<i>Cladophora glomerata</i>	<i>Fontinalis antipyretica</i>	<i>Drepanocladus aduncus</i>	<i>Eurhynchium riparioides</i>	<i>Ranunculus fluitans</i>	<i>Myriophyllum spicatum</i>	<i>Polygonum amphibium</i>	<i>Elodea canadensis</i>	<i>Eleocharis palustris</i>	<i>Sparganium ramosum</i>	<i>Schoenoplectus lacustris</i>	<i>Potamogeton perfoliatus</i>	<i>Potamogeton crispus</i>	<i>Potamogeton natans</i>	<i>Potamogeton pectinatus</i>	<i>Zannichellia palustris</i>
49.0	Challies Station	++	++													
49.5	Holy Well Burn	++	+						+							
50.0	Willington Sewage Works	++							++							
50.5	Willington Park	++	+				+		+			++				
51.0	Jubilee Bridge	++										++				
51.5	Skitts Wood	++	+						+			+				
52.0	The Strait	+							+			+				
52.5	Hagg Beck		+						+			+				
53.0	Swang Plantation	++	+						++							
53.5	Page Bank Beck	++	+				+	++				+				
54.0	Page Bank Bridge	++	+					++				++				
54.5	Brancepeth Burn	++						+				++				
55.0	Valley Burn	++						+				++			+	
55.5	Spring Wood	++	+			+		+				+				
56.0	Waterside Lane	++						+				+				
56.5	Holywell Hsll	++						+				++			+	
57.0	Holywell Hall Beck	++	+					+				++				
57.5	Nickynack Beck	++	+					+				++			+	
58.0	Sunderland Bridge	++	+					+				+				
58.5	Croxdale Bridge	++	+					+				+				
59.0	River Browney	++	+					+				+			+	
59.5	White House	+				+		+				+				
60.0	Low Burnhall	++	+					+				+			+	
60.5	Farewell Hall	++	+					+				+				
61.0	Low Butterby	++						+				+			+	
61.5	High Houghall	++						+				++			+	
62.0	Croxdale Wood	++						+				+				
62.5	Butterby Wood	++										++			+	
63.0	The Sliddings	++	+									+			+	
63.5	Shincliffe Wood	++	+									+				
64.0	Shincliffe Hall	++	+									+				
64.5	Houghall	++							+			+				
65.0	Shincliffe Bridge	++							+			+				
65.5	Agriculture School	+										+				
66.0	Maiden Castle	++										++			+	
66.5	Old Durham Beck	++							+			+			+	
67.0	Pelaw Wood	++	+						+			+			+	
67.5	Brown's Boat-house	++				++						++			+	
68.0	Elvet Bridge	+										+				
68.5	Count's Corner	+										+				
69.0	Prebend's Bridge	++	+						+			++				
69.5	Framwellgate Bridge	++	+			++						++				
70.0	Durham Sands	++	+			+			+			++				+
70.5	St. Mary Magdalene's Chapel	++	+			+			+			++				
71.0	Kepier Hospital	++							+			+				
71.5	Old Mine, Kepier	++				+			+							
72.0	Frankland Farm	+	+			+			+			++				
72.5	High Grange	++	+						+			++				
73.0	Frankland Wood	++							+							

Km	Name of	Length	<i>Cladophora glomerata</i>	<i>Fontinalis antipyretica</i>	<i>Drepanocladus aduncus</i>	<i>Eurhynchium riparioides</i>	<i>Ranunculus fluitans</i>	<i>Myriophyllum spicatum</i>	<i>Polygonum amphibium</i>	<i>Elodea canadensis</i>	<i>Eleocharis palustris</i>	<i>Sparganium ramosum</i>	<i>Schoenoplectus lacustris</i>	<i>Potamogeton perfoliatus</i>	<i>Potamogeton crispus</i>	<i>Potamogeton natans</i>	<i>Potamogeton pectinatus</i>	<i>Zannichellia palustris</i>
73.5	Kepier Wood Upper		++	+								++				+		
74.0	Kepier Wood Lower		++	+				+				+	+					
74.5	Belmont Viaduct		++	+										++	++			
75.0	Woodwell House		++					+				+			++			
75.5	Grange Wood Beck		+		+			+	+		+	+	+	++	++			+
76.0	Mallygill Wood		+		+			+			+							
76.5	Raintonpark Wood		++		+							+			+			
77.0	Cocken Sewage Works		++									+		+				
77.5	Finchale Banks		++									+		++			+	
78.0	Finchale Priory		++		+							+						
78.5	Cocken Rock		++									+		++				
79.0	Finchale Wood		++									+						
79.5	Redhouse Gill		++					+				+						
80.0	Stockley Heugh		++					++				+		++				
80.5	Cocken Bridge		++		+							+		++				
81.0	Harbourhouse Park		++		+							+		+++			+	
81.5	Dairy Wood			+														
82.0	Bowburn Wood		++		+													
82.5	Paste Egg Bank		++											+				
83.0	Lumley Grange		++											+				+
83.5	Long Wood Beck		++											+				
84.0	Chester Dene											+		+		+		
84.5	Below Chester Dene											+		+		+		
85.0	East Lodge			+										+++				
85.5	Crichton Avenue			+										+++				
86.0	Boathill Plantation			+								+		+++				
86.5	Near Lumley Grange			+								+		+		+		
87.0	Brough Gill			+								+		+		+		
87.5	Lumley Bridge			+				+				+		+++				
88.0	Below Lumley Bridge		++		+			+				+		+++				
88.5	Stella Gill		++									+		+++		+		
89.0	Park Road		++									+		+++		++		
89.5	The Staples		+											++			+	
90.0	Lambton Bridge		++											+				
90.5	Cherry Bank		++											++		+	+	
91.0	Picktree		++											++			+	
91.5	The Bottoms		++														+	
92.0	Lamb Bridge		+														+	
92.5	Lambton Well		+														+	
93.0	New Bridge		+														+	
93.5	Carr's Hole		+														+	
94.0	Charter's Haugh		++	+											+		+	
94.5	Fatfield		+											++			+	
95.0	Penshaw Staiths		++											+				
95.5	Long Reach		++											++			+	
96.0	Victoria Bridge		++														+	
96.5	Washington Staiths		++															

TABLE II—Distribution of plants in River Wear in mid-late summer 1966 as indicated by their presence or absence in individual 0.5 km reaches

DISCUSSION

COMPARISON WITH R. TEES

In general, the distribution and behaviour of macrophytes in the Wear resembles that described for the Tees by Butcher *et al.* However there is no upland slow-flowing reach of the Wear (or its tributaries), and none of the species recorded by Butcher *et al.* in the Tees only from the Weel were found in the Wear. There is no one site on the Wear, corresponding to the entry of the Skerne into the Tees, below which there is a marked increase in abundance and number of macrophytic species. Instead there is a gradual increase passing down river as far as the tidal reach, where the number of macrophytic species becomes reduced again.

The Tees above Croft is best compared with the Wear above Frosterley, and as far as macrophytes are concerned the differences are only very minor. Butcher *et al.* reported *Grimmia alpicola* Hedw. var. *rivularis* (Brid.) Broth. and *Cephalozia fluitans* as km 40.0-40.5, but during late summer low flow periods occasional plants have occurred rare in the Tees above Middleton-in-Teesdale. Neither were found in the Wear. *Drepanocladus aduncus* and *Scapania undulata* were recorded from the upper reaches of the Wear but are not in the lists from the Tees.

When comparison is made of the Tees below Croft with the middle and lower reaches of the Wear, a number of contrasts are evident:

- 1 Butcher *et al.* list neither *Sparganium ramosum* nor *Eleocharis palustris*. However a recent survey has indicated that both species are (now at least) present, although the latter in particular is considerably less abundant than in the Wear. The more consistent shading of the banks of the Tees, the frequent steepness of the banks, and presumably also the greater flood effects, might all be expected to contribute to this difference. Evidence for such an effect of steep banks and shading on *Sparganium* is given above when discussing its bimodal distribution in the Wear.
- 2 The near absence of *Ranunculus fluitans* from the Wear as compared with its abundance in the Tees has been treated in detail above.
- 3 Almost all the other differences between the Wear and the Tees may be interpreted as associated with a greater tendency for development of a silted river bed in the former. *Polygonum amphibium* and *Potamogeton natans* are present in the Wear but absent in the species list of Butcher *et al.* *Potamogeton perfoliatus* was abundant in the lower Wear but recorded as very rare in the Tees.
- 4 *Potamogeton pectinatus* var. *interruptus* became abundant in the Wear only at Chester-le-Street, whereas it was abundant in the Tees right up to Croft. This species is very tolerant of organic pollution, so may well be favoured especially by high nutrient levels.
- 5 *Enteromorpha* was sometimes abundant in the Wear, but not recorded by Butcher *et al.* from either the Skerne or the Tees. However Whitton and Dalpra (1968) did find it in the former river in 1963-1965. *Leptodictyum riparium* also was not recorded by Butcher *et al.*, although recently it has been found occasionally in the lower Tees.
- 6 *Nitella opaca* L. and *Potamogeton pusillus* L. were recorded as rare in the Tees by Butcher *et al.* although not found by Whitton and Dalpra. It seems likely that neither species occurs in the Wear, although *P. pusillus* could easily be overlooked.

COMPARISON WITH OTHER RIVERS

The literature on the vegetation of fast-flowing rivers is too sparse to make much comparison worthwhile. Physically, chemically and floristically the most similar river in the literature is the R. Wharfe (Yorkshire) described briefly by Butcher (1933). As compared with the present results from the Wear the most interesting differences are the listing of *Ranunculus fluitans* as dominant, *Potamogeton densus* as frequent and *Sium erectum* (= *latifolium*) as occasional in 'swift portions lower down among large stones' and *Sparganium simplex* Huds. as frequent in 'slower portions among gravel'. Butcher did not include either *Potamogeton crispus* or *P. pectinatus* var. *interruptus* in his list from the Wharfe.

The absence of any record of *Brachythecium rivulare* from the Wear is surprising (E. C. Wallace, personal communication). It seems possible that this moss may have been overlooked.

Apparently no European mainland rivers have been described with an obviously similar floristic composition. However all the angiosperms present in the Wear are widespread in the Danube system, according to the comprehensive list of Szemes (1967).

POSSIBLE FUTURE CHANGES

Prediction of future changes is difficult because of the sparseness of either comparative data from other rivers or earlier records from the Wear. However any changes in macrophyte populations would be of considerable biological interest, and possibly also some economic significance. The authors will therefore follow the advice of Edwards (1969) and 'hazard a guess'.

Even if no further changes take place in the usage of the river, it seems probable that there will be changes in the populations of macrophytes. As discussed above, there is a possibility that *Ranunculus fluitans* might build up much larger populations if there are now a few winters free of very severe floods. Obviously deliberate planting would aid any such spread. Planting might prove more successful than last time if it is carried out at sites between Bishop Auckland and Cocken Bridge rather than at the upstream sites tried in 1959.

Two other changes seem likely even without further hydrological, physical or chemical changes in the river. It is suggested that small beds of *Potamogeton pectinatus* var. *interruptus* will develop in fast-flowing reaches further upstream than at present. Also it seems very probable that *P. perfoliatus* will form a fringe near the banks in many slower-flowing reaches where it is now absent, and also spread further away from the banks in many reaches where it is already present.

The most likely future changes in the use of the river which would influence the growth of macrophytes are:

- 1 Building of upland regulatory reservoirs, which would reduce the effects of flooding and possibly also prevent the river sinking very low in periods of drought.
- 2 Improvement of sewage works leading to a reduction in suspended matter in the water and an increase in the level of at least some inorganic nutrients available immediately below the works.
- 3 An increase in total nutrients added to the river by fertilizers etc.
- 4 Abstraction of water at lowland sites, leading to somewhat lower flows.

All four of these changes might be expected to lead to increased growths of macrophytes. Any reduction in flow during flood periods and any reduction in suspended matter are likely to prove most effective in producing such an increase. However these changes are also likely to increase the density of algal plankton in summer low flow periods, so the increase in light reaching submerged macrophytes may not be so great.

If these hydrological, physical and chemical changes do in fact take place, they will probably accentuate the changes in the three species discussed above. In particular it seems possible that *Potamogeton perfoliatus* may form beds right across the river at some sites. With increased periods of moderately low summer flows, the rapid-growing surface macrophytes, *Enteromorpha flexuosa* and *Lemna minor*, may be expected to increase in sheltered reaches, possibly sometimes in densities sufficient to reduce locally the growth of submerged macrophytes. Other possible changes worth mentioning, though less certain than the above, are:

- 1 Increase in growths of *Cladophora* in fast-flowing stretches between Bishop Auckland and Chester-le-Street.
- 2 Increase in growths of *Vaucheria* and *Fontinalis*, particularly in medium-fast stretches.
- 3 Change in status of *Myriophyllum spicatum* from being a casual to an occasional species.
- 4 A small-scale spread of a few species at present absent from the river e.g. *Callitriche stagnalis* and *Potamogeton pusillus*.

SUMMARY

A survey is presented of the angiosperms, bryophytes and macrophytic algae in the Wear, a fast-flowing river in N-E. England. Brief background details are included of physical, chemical and historical aspects of the river. The presence or absence in each 0.5 km length of the river of each macrophyte was recorded in summer 1966, and general biological data collected for each species between 1965 and 1969.

The situation in the Wear may be summarized by stating that the river shows from source to mouth a gradual decrease in flow rate, a gradual increase in the level of important nutrient ions, and a gradual change in the nature and amount of macrophytic vegetation. In the latter two aspects it shows a marked contrast with the Tees, an

adjacent river studied in detail by previous authors, where the inflow of one tributary brings about a major change in both water chemistry and nature and amount of macrophytic vegetation.

The available data, largely circumstantial, indicates that the Wear has changed markedly since about 1955, with a great decrease in pollution associated with the coal industry and a large increase in growths of macrophytes. The behaviour of *Ranunculus fluitans* is discussed in some detail, as it appears possible that this species may have been especially sensitive to the previous pollution in the river.

An attempt is made to predict likely future changes in the vegetation of the Wear, both on the assumption that no further changes in hydrology and water chemistry will take place, and on the assumption that present tendencies for changes in these factors will continue.

ACKNOWLEDGEMENTS

This paper forms part of a survey of the River Wear carried out with financial help from the Natural Environment Research Council, the Northumbrian River Authority, Newalls Insulation & Chemical Co. Ltd. and Mr. D. Nicholson. We are very grateful for their support. In addition a large number of people have aided in the survey in some way. Mr. S. Pepper, the river-bailiff provided many interesting observations. Others who have helped with the basic survey or provided useful information include Messrs. G. Bainbridge, L. Davies, J. A. Dodds, A. Francis, A. Jamieson, D. L. Richardson, K. Smith, R. V. Smith, M. Snow, W. Tully, and W. B. Woodward. We thank Dr. K. Benson-Evans, Professor C. D. K. Cook and Mr. E. C. Wallace for helpful correspondence, Mr. J. S. Redhead for preparation of figures and Mrs. Vivienne Evans for excellent secretarial help.

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CORRESPONDENCE

Dear Sir,

In my short paper on "Some Changes in Bird Life in Yorkshire" (*Nat.* 1969; 109-114), I indicated that since it consisted in part of personal impressions, it might give rise to discussion and comment. I had hoped that criticisms would be on subject matter rather than in the pedantic vein of Mr. Mather's letter (*Nat.* 1970; 74).

Whether the use of scientific names is necessary in this kind of article is a matter of opinion, but I will confine comment to the letter's final "every attempt should be made to ensure that the reader is in no doubt about the species referred to", and simply question whether any reader is likely to be in doubt about which Cormorant and Heron nest in the county etc. If so, I must apologise for the inconvenience I have occasioned him by making it necessary to refer to original sources. I firmly believe that the majority of readers of *The Naturalist* will welcome any possible reduction in the amount of unnecessary jargon.

R. F. DICKENS.

BOOK REVIEWS

Studies in the Vegetational History of the British Isles, edited by D. Walker and R. G. West. Pp. 266 with numerous text figures and maps. Cambridge University Press, 1970. 160/-.

This splendid book of essays was written in honour of Professor Harry Godwin, now Sir Harry Godwin, at the time of his retirement. All the authors have worked with him at some time and the uniformly high standard is a tribute both to his teaching and his inspiration.

There are eleven essays beginning with two which trace the history of British vegetation since the end of the Tertiary Period and concerned particularly with the effect of the Pleistocene glaciations. The second essay is concerned especially with the Ericaceae and suggests that some species may have survived glacial conditions on refugia off the coast of Connemara. The third deals with the relative changes in land and sea level which have occurred in Scotland and indicates something of the great complexity of that particular branch of geology.

The next three essays cover the vegetational changes which have occurred since the retreat of the ice of the last glaciation. The one dealing with the north-west of England and especially with the Lake District is an excellent example of the fruitful results of co-operation between palaeobotany, geology, archaeology and soil chemistry. Another deals with the effect of Mesolithic and Neolithic man on vegetation, suggesting that Mesolithic man may have had a considerable influence on vegetation through burning. The last concerns the period since the Neolithic and shows how it may be possible by the use of pollen analysis to estimate the extent and intensity of forest clearance.

The other essays are concerned more with evidence from macrofossil remains, including the varying pattern of hydroses (hydroses are probably much more flexible than was thought previously and the natural climax of autogenic hydroses is bog and not oakwood) and evidence of recent changes of vegetation derived from stratigraphy (the original *raison d'être* for the Blelham Bog nature reserve can no longer be upheld thus indicating the danger of drawing too precise conclusions from the present day distribution of vegetation).

The ninth essay is a long and rather difficult one suggesting the possible temperature factors which limit the present distribution of arctic-montane plants in Britain. The final essays describe the identification of pollen and macrofossils especially as carried out in the Botany School at Cambridge.

These essays together form a very stimulating and interesting study. The only thing which is to be regretted is the cost which is likely to deter all but those with a specialised interest in Quaternary palaeobotany. However all naturalists, especially those with botanical leanings, should find it worthwhile to borrow this book and are certain to find in it much of interest.

D.D.B.

Nature Conservation in Britain, by Sir Dudley Stamp. Pp. 273 with 23 black and white photographs and 5 maps. Collins New Naturalist Series, 1970. 36/-.

I found this book disappointing because it turned out to be more of a history book than one concerned with ideas. The first chapter deals with the present situation in Britain and emphasises the urgent need for conservation in a country where the demands on land are numerous and varied. This is followed by a chapter dealing with

the origin and history of the conservation movement and a chapter on the history of the Nature Conservancy. Special attention is given to the particular problems associated with the large-blue butterfly, grey seal and red deer. Also dealt with are, the law in relation to the land and to nature conservation, farming and wild life, and forestry. The later part of the book is devoted to the description of the more interesting nature reserves and areas of outstanding wildlife interest throughout Britain. The bibliography and appendices on the Council for Nature, the Nature Conservancy, Field Studies Council and Conservation and other Allied Areas, are useful.

The declared aim of the editors of the New Naturalist series "... is to interest the general reader in the wild life of Britain..." and this they have succeeded in doing in many fine volumes. In the present book I do not think that they have succeeded; there is much of interest but it is padded out with considerable verbiage. The historical treatment is dull and so is the "guided-tour" of Britain's nature reserves. This is particularly unfortunate in a year when the "general reader" is being bombarded with information and interesting articles on conservation in the press and in local exhibitions. The public is more aware than ever before of the need for conservation and a book which dealt in detail with the various problems of nature conservation and put it more firmly into the general picture of conservation as a whole would have been very welcome.

D.D.B.

Organization and Control in Prokaryotic and Eukaryotic Cells. Symposium 20 of the Society for General Microbiology. Edited by H. P. Charles and B. C. J. G. Knight Cambridge University Press. 1970. £5.

The purpose of the Symposium on which this excellent book is based was to place information on prokaryotes side by side with related facts about eukaryotes, in an attempt to illuminate problems of interrelations between the two types of living organism. The book is primarily aimed at undergraduate and postgraduate biologists, but the school teacher may well find it of value for VI form reading (as well as for his own study). The first chapter, in which Prof. Stanier considers general aspects of cell biology and the supposed evolution of eukaryotes from prokaryotes, will be particularly rewarding for VI form discussion but the remaining chapters are probably too specialised for this purpose. However, even in these the enquiring pupil will find selected paragraphs, diagrams and photographs to fire the imagination, and if he starts reading Alison Newton's beautifully clear account of the requirements of a virus he will surely read it through to the end.

After Prof. Stanier's introductory discussion, there follow chapters which deal comparatively with the genetic code, ribosomes, ribosomal RNA synthesis, metabolic patterns, membranes, surface structures, photosynthesis and the photosynthetic apparatus in prokaryotic and eukaryotic cells. Finally, the remaining chapters consider plastids and chromosomes in prokaryotes, the evolutionary significance of recombination in prokaryotes, organelles in microbes, DNA in eukaryotic chromosomes, the diploid state and reproduction of mitochondria and chloroplasts. There is also a useful glossary and a reprint of E. C. Dougherty's 1957 article in which the terms 'prokaryotic' and 'eukaryotic' were introduced.

G.F.L.

Secrets of Plant Life by Marcel Sire. Pp. 240 with over 300 colour photographs. Collins, 1970. 6 guineas.

This is a picture book devoted primarily to the photographic illustration of floral and vegetative detail rather than of flowers and plants. More than 300 colour photographs covering about 80 species, nearly all of them flowering plants, portray floral structure by life-size illustrations of flowers supplemented by numerous enlargements ranging up to 30 times life size of the dissected flowers or developing fruits. These enlargements are the distinctive feature of the work and since the quality both of the photographs and their reproduction is first rate, the effect is to present the detail of small flowers and bud dissections as seen under a binocular microscope. Those of the more insignificant flowers of many trees such as poplar, elm or oak magnify their beauty as well as their size whilst the sequences showing the complete biological cycle of four plants from seed through germination to flowering and fruiting are also of great beauty. Short descriptive commentaries and appropriate literary and poetic excerpts accompany the photographs which blend aesthetic pleasure with botanical precision and technical mastery. Even so the price will deter all but the few.

W.A.S.

Plant Growth by Michael Black and Jack Edelman, Pp 185 with 16 plates. Heinemann: Scholarship Series in Biology. £1 10s. 0d.

In this well-produced and very readable little book Dr. Black and Professor Edelman survey in broad outline the whole field of plant growth. The book is divided into four sections. The first, "What is growth?" deals with patterns of growth, measurement of growth and changes which occur during cell growth. Next, "The internal control" is concerned with phytohormones, growth regulators and inhibitors; their effects, interactions, practical use and mode of action. In the third section "The external control", the effect of factors in the environment – light, gravity and temperature-on growth are discussed and in the last section, "Control of development," the effect of these factors is considered in relation to differentiation, morphogenesis, flowering and dormancy.

In each section the subject is developed logically and the text is liberally illustrated with diagrams. Where biochemical knowledge is required, as for instance protein, polysaccharide and protein synthesis in the chapter "What happens when a cell grows," the necessary background information is given in a clear, concise manner. There is a summary at the end of each chapter but the lack of references in the text is disappointing. Although there is a brief reading list at the end of the book, it would have been more appropriate to have one at the end of each section and, in view of the fact that the reader is introduced to current research, to have included some research papers.

This book should prove very useful to teachers and sixth formers in schools and to students in Colleges of Education, Polytechnics and Universities.

EDITH HARRISON.

The Book of the Garden Pond by George F. Hervey and Jack Hems. Pp. 211 with 9 plates (1 in colour) and 12 text figures. Faber and Faber, London 1970. 45/-.

This is a slightly revised edition of a book first published by Stanley Paul in 1958. As its title suggests this is essentially a book for the amateur gardener, giving guidance on the construction, maintenance and stocking of the small garden pond and its surrounds. As such the book does have the merit of being based on experience; much of the advice is sound if sometimes overfussy, and the style is readable. However, such subjects as construction are not dealt with in any logical sequence and presentation throughout is marred by an irritating proliferation of footnotes. Many of these could have been omitted without loss and the rest would have been far better incorporated in the text.

Unfortunately the authors, as in so many gardening books, are not content to preach from experience and in the search for extra tit-bits of information wander on to less secure ground. Spelling mistakes are notably few but there are a number of errors of fact, mainly in connection with plants. Even the glossary is faulty in places but space does not permit a list of corrections here. Finally, one fails to see the need, even in a chapter on the breeding of pond fish, for a description of the structure of a sperm (including even a mention of *mitochondria* – spelt thus!) and an account of embryogenesis. However, provided all the background information is not automatically accepted as correct, this will prove a useful and practical book for the beginner.

T.S.C.

Atlas of Breeding Birds of the West Midlands, edited by J. Lord and D. J. Munns. Pp 276. Collins, 1970. 30/-.

The results of a field survey undertaken during the years 1966, 1967 and 1968 as a pilot study in connection with the Bird Atlas currently being prepared by the British Trust for Ornithology, the present atlas is a valuable contribution in its own right and is a monument to the co-operative effort organised by the West Midland Bird Club.

Methods and techniques of recording are discussed, sample recording card and instructions are included, and there is consideration given to some of the problems involved in this sort of joint effort ("Controversial Issues"). Among the five appendices, two list West Midland waters and Nature Reserves of ornithological importance.

For the most part the book consists of maps showing the distribution, based on 10 km. squares of all the species which breed in Warwickshire, Worcestershire and Staffordshire, together with attractive sketches and notes on each of them. Besides producing the maps, A. J. Richards is secretary of the West Midland Bird Club. He and his team, as well as the editors, deserve every credit for setting the pace and so high a standard. Obviously any organisation undertaking similar surveys will derive the utmost benefit from their experience and expertise.

R.F.D.

'Instinct' and 'Intelligence'. The behaviour of Animals and Man by S. A. Barnett. Pp. 327 with 16 photographic plates and 66 text figures. Penguin Books, 1970. 10/-.

This is a Pelican edition, now revised, of a book previously published in 1967 and so provides, at very reasonable cost, an invaluable introduction to the study of animal behaviour. The author is an active worker and university teacher in this field and has produced the kind of book which is a synthesis of research done in this field and a guide to the understanding of ethology, the science of animal behaviour, which has resulted from it. It is therefore equally readable by the layman who wishes to know why his pets behave as they do, and what principles he should use in training them, and by the serious student of animal behaviour at sixth form or undergraduate level who wants to know the sources from which these principles have been derived.

The book is conveniently split up into sections. After a short introduction on understanding behaviour, there are five chapters describing different forms of behaviour. Some of these describe specific behaviour shown by particular animals e.g. case histories, and some describe the variations shown by different animals in behaviour common to many groups e.g. courtship. Then follow two chapters on nervous systems as these are vital to an understanding of the perception and response upon which all more complex behaviour is built. The last section of the book is on general principles; how behaviour develops, what is instinct, what is intelligence, how the behaviour patterns associated with these differ and finally what are the sources of human behaviour. Comparisons with human behaviour are in fact introduced at all stages since man is of course an animal, even if the most highly evolved one.

This book will provide the answer for those who wish to learn something of animal behaviour from a source which they can keep for reference. I.W.

The Natural History of Sharks, by Thomas H. Lineaweaver III and Richard H. Backus. Pp. 256 with 47 text photographs and figures. Andre Deutsch, London, 1970. 55/-.

Some animals are more popular than others but only the sharks seem to have no friends at all. However, even if they cannot evoke affection, the sharks are worthy of much respect and are proving of mounting zoological interest. In many of their more obvious anatomical details they appear to approach more nearly than other living forms to the basic vertebrate plan, but in many subtler ways – as in their sense organs and methods of reproduction – it has become apparent that as a general impression this is quite misleading. Nevertheless when one considers how similar in appearance are the modern types to their ancestors in the Devonian and makes a comparison with the changes that have taken place over the same period in the bony fish, not to mention in ourselves, it remains extraordinary that the sharks should be now as successful a group as they have ever been, and indicates equally how much we must still have to learn about them. The present book does not go deeply into morphological or physiological questions, rather it amply justifies its title and can be described as a thoroughly accurate and well-informed natural history; it is also attractively written and admirably illustrated and altogether can be warmly recommended. T.K.

The Camel in Australia by Tom L. McKnight. Pp. 154, with twelve black and white photographs and twelve text figures and maps. Melbourne University Press, 1969: agents, International Scholarly Book Services, Inc., 232 High Street, Harlington, Middlesex. £2 10/-.

The author, an American Professor of Geography, studied Australian camels and their history whilst on an extended tour of Australia. The result of his studies is an interesting, provocative and yet scholarly work. How many of us realise that the camel is the most common ungulate mammal over one sixth of the continent? Or that it has only been there since 1840? The subject of this book may seem a remote field for investigation but, probably because it was tackled by a geographer, the blend of history, geography and camel ecology results in a fascinating saga.

With their colourful "Afghan" drivers, camels have made their mark on Australia, contributing to the explorations of the early days, the commerce and development of later times and even, recently, providing a bizarre form of "sport". Somehow, such improbable animals as *Camelus dromedarius* seem to fit well into the improbable (in many ways) land of Australia. They are amongst the oldest of the "new" Australians and one hopes that they will continue to prosper. T.M.C.

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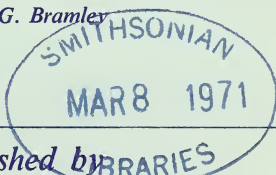
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The Y.N.U. Newsletter, sent to all Full members and Affiliated Societies, is published three times a year: February, May and November. Its aim is to provide a means of intercommunication between all members by giving, for example, reports on Y.N.U. and Society meetings and activities, items of broad Natural History interest, details of all types of surveys and enquiries. All items should be sent to the Newsletter Editor: Mr. H. T. James, 238 Sigston Road, Beverley, Yorks.

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A SUMMER OVERTURN AND ITS EFFECTS ON THE FISH FAUNA OF AN OLD YORKSHIRE CLAYPIT POND

JOHN T. DEALTRY

Although such events are perhaps not uncommon in tropical and sub-tropical countries, there are not many recorded accounts of kills of fish as a result of sudden summer overturns in lakes in Britain, and few instances where a complete count of the fish fauna could be made. The hot dry summer of 1969 gave a unique opportunity for such a count in an old claypit pond at Kilpin, Howden, in East Yorkshire. There is a vague report of the death of many fish in the same pond approximately thirty years ago.

The pond concerned is rectangular in shape, being 189 m. long by 99 m. wide. The average depth is 5 m. with a rectangular bottom plateau a little to the south of centre, some 80 sq.m. in area where the depth of the water is 3.5 m. The long axis of the pond, which is enclosed by a tree belt, lies due east and west, and has steep sloping sides, but at the eastern end there is a shallow area 3 to 4 m. wide with a depth of between 30 and 60 cm. The position of this shallow area is important and I shall refer to it as the "shallows".

Within the context of limnology an overturn is a wind-induced action which normally takes place in the spring and late autumn, and mixes the upper layer of water or epilimnion, which is rich in dissolved oxygen, with the lower layer of water or hypolimnion. Through the summer the latter may have become depleted of oxygen as a result of bacterial action on the plant and animal remains which have 'rained' down from the epilimnion and as a result of the events taking place in the bottom mud. These two layers of water which may remain at different temperatures throughout the summer, are separated by a region known as the thermocline in which the temperature changes rapidly in a vertical direction. The epilimnion is circulated by wind action without mixing with the hypolimnion. With the coming of autumn and the lowering of the temperature of the water within the epilimnion and the possibility of stronger winds, a gradual mixing of the two layers of water takes place without any untoward effects upon the pond fauna, and the hypolimnion is thereby re-oxygenated.

In tropical and sub-tropical countries a sudden, partial or complete overturn has sometimes been reported, which, by bringing masses of de-oxygenated water to the surface, may result in the asphyxiation of fishes. Mass mortality of fishes, running into many thousands, or even millions, may ensue. For records from the African lakes Victoria, Bangweulu, Mweru and George, see Fryer and Isles (in press).

Of all the reports concerning the death of fishes in temperate climates very few are from ponds; reports from rivers are probably the most common, when fishes often die in considerable numbers. Some of these occurrences are caused by pollution, others as a result of natural events. The latter are usually in hot dry times with a slower than normal water flow in the stream or river and often after a local thunderstorm has washed into the river the de-oxygenated water from pools or stagnant dykes. This may be in large quantities if the gathering ground is sufficiently great and the pools contain exceptional amounts of decaying matter. In small ponds, however, a mass of growing water plants may use up, by respiration during the night, most of the dissolved oxygen to the detriment of the fishes.

It has been assumed in the past that in ponds of 4 to 6 m. depth, such as the one described, a thermocline is seldom established and there is a good deal of literature to show that this is often so. Exceptions, however, occur. Work on three similar ponds has recently been published (Moss 1969, Goulder 1969) and has shown that temperature and oxygen stratification may occur both in summer and winter. One of the main factors would appear to be the extent to which wind action can influence the mixing.

Before describing the events of 1969 details are given of conditions prevailing in the pond in spring and early summer of 1970, when the weather pattern was similar to that of 1969, but with longer periods of continuous sunshine up to mid-June than in 1969. I am able to include a note on the thermal and dissolved oxygen stratification on three days in June and one date in July 1970. (See figure I A and B).

Throughout the period studied, the temperature gradient shows a more or less steady fall and no clear-cut thermocline. The oxygen profile, however, shows a sharp division between the 1.0 and the 1.5 m. levels on three days and indicates that stratifi-

cation had taken place, and persisted even after a period of wind. The readings for the two graphs were all taken from a single station near the centre of the pond. Readings near the east and west ends, and also at the ends of the under-water plateau, differ slightly from these.

The above information probably helps to explain what happened in the pond in August 1969, particularly when one remembers that July, and most of August of that year remained calm and warm.

The pond is without inlet or outlet, except for some natural drainage, which must bring in some nitrates, phosphates and other salts. Loss of water is by evaporation and seepage at higher levels when the surrounding water table level falls in dry seasons. Seasonal variations in level is about 40 cm.

The whole of the shore has a continuous margin 2 to 3 m. wide of the common reed (*Phragmites communis*), up to 2 m. of these plant stems being below the water. This, and other plant life, begins to rot down with the coming of winter, and additional nutrients in the form of droppings are spread over the whole pond by the large duck population which gathers at certain times. (The importance of this on an enclosed body of water I feel is often overlooked).

With the lengthening days of spring, and the rise in temperature, vegetation is rejuvenated, and the phytoplankton increases in abundance, often for a time giving the water a deep green colour. This phytoplankton gradually uses up the nitrates and phosphates and perhaps most of the silicates. Likewise, invertebrates increase in numbers in the spring, and relatively large numbers of copepods, cladocerans and rotifers are to be found among the reeds, in the open water and among the bottom mud, together with the larvae and nymphs of many insects. Some members of the zooplankton are carnivorous but by far the largest number feed on the phytoplankton and detritus and are in turn eaten by small, and in some cases, large fishes.

The winter of 1968/69 was harder than usual and the pond surface had a 3 to 9 cm. cover of ice for a continuous period of 6 to 8 weeks, ending in late February. With the thaw came the rain and floods. Some of the surrounding fields were flooded and water flowed over a low bank, adding some 25 cm. to the pond depth and perhaps also rapidly raised the temperature of the top layer of water. The in-flowing water was from rich arable land, heavily fertilised. Unfortunately this water was not tested for its chemical content at the time, but a dyke close by under flood conditions the previous year held in solution so much nitrate and phosphate that all the animal life was annihilated and it was late summer before even a few animals appeared.

Spring thus saw the pond in a very 'rich' condition. This was well borne out a few weeks later with the first and major crop of phytoplankton. This was the heaviest I have seen in the pond, the deep green colour only permitting a white disc to be seen to a depth of less than 20 cm. This would be a rich form of food for the large numbers of the zooplankton animals in the pond in early June, and these, in turn, would be a rich source of food for the fishes.

From May onwards very little rain fell and both night and day temperatures were well above average, being interspersed with periods of hot weather. This led to a temperature build-up in the upper layers of water and to early thermal stratification. The dense fauna would be adding to the chemical build-up and the oxygen deficiency in the hypolimnion.

Nothing else extraordinary took place, except perhaps that both the large and small pike (*Esox lucius*), together with roach (*Rutilus rutilus*) of 5 to 12 cm. length, were to be seen sunning themselves in the shallows more frequently than usual. On August 20 a change in the weather brought a westerly wind which rose from force 2 in the morning to force 7 by midnight, and ranged from F. 6 to 7 for twenty-four hours on the 21st. By the 22nd at noon it was F. 5, and was down to F. 2 by midnight. It was not however, until the late afternoon of the 23rd, some 80 hours from the start of the first wind action, that something unusual was seen to be taking place. From a distance, the shallows and some 6 m. beyond, appeared to be covered with dark blobs. On inspection, these proved to be the half-emergent snouts of thousands of small fishes gulping for air, and in many cases leaving behind large bubbles. At the same time it was noticed that many large and small pike, together with some large roach, were assembled in the shallows, to be later joined by eels (*Anguilla anguilla*). One was also conscious of a smell of hydrogen sulphide.

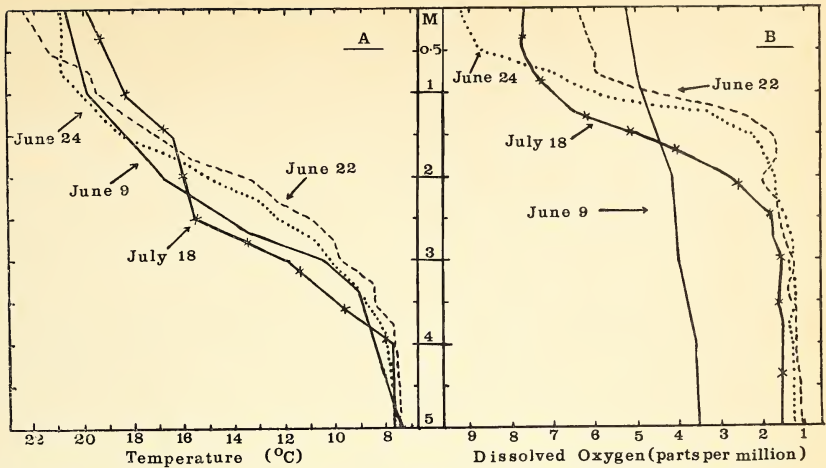


Fig 1. Relationship of temperature (A) and dissolved oxygen (B) with depth.
In pond on certain days in 1970.

Figure A shows the temperature profile of June 9th after some weeks of hot, dry weather. This was followed by a period of 13 days of very hot, still conditions to June 22 when the surface temperature rose to 22.5 C. Following two days of force 5 to 6 winds the surface temperature was somewhat lowered and the upper 0.75 m. of water had a uniform temperature. From June 24 to July 18 was a period of variable winds up to force 7, mostly westerly, and including a thunderstorm on June 27, giving 4 cm. of rain. The effect of this period is clearly seen from the temperature curve for July 18.

Figure B shows the dissolved oxygen content of the water taken at 25 cm. intervals. The highest reading (9.28 p.p.m.) was at the surface on June 24 (during a period of wind). The lowest reading (1.07 p.p.m.) just above the bottom on June 22 after a period of hot weather, is equivalent to 7.5% saturation at 7.6°C.

Number	1	1	2	3	1	2	1	1	3	10
L'gth (cm.)	94	88	86	84	71	66	58	50	48	23-38

Table 1:- The size of pike removed from pond.

Live Pike (left in pond)		ROACH			
		DEAD		SURVIVED	
NUMBER	LENGTH (CM)	NUMBER	LENGTH (CM)	NUMBER	LENGTH (CM)
1	71 to 76	12	38 to 44.5	8	35 to 38
7	45 to 50	—	—	8	12 to 18
11	20 to 30	45	5 to 10	Estimate	5 to 12
					1,000 or more

Table 2:- The size and numbers of pike and roach in the pond in addition to the large pike shown in Table 1.

NOTE: Sizes of surviving fish are only estimates but are reasonably accurate, having been measured against objects of known sizes in the water.

Immediate steps were taken to aerate some of the by now inky-looking water in part of the shallows and this no doubt saved the lives of a great many fishes. It also accounted for the fact that during the next 24 hours the whole of the fish population in the pond came to be concentrated in this small area of water. They no doubt found their way there by following the oxygen gradient and by seeking to escape from the inhospitable surface water. This was by now in a continuous rolling motion from west to east, bringing with it the products of the hypolimnion.

As it was desired to reduce the pike population, opportunity was taken to remove 25 individuals whose lengths are given in table 1. The largest pike weighed 4.2 kg., had a suggested age based on opercular rings of 7 years and a lateral jaw width at the angular pivots of 145 mm. Estimates of the number and sizes of the pike remaining in the pond are given in table 2, which also provides data on the roach population. The largest roach 44.5 cm. long, weighed 0.92 kg. and had a body depth of 23 cm. From opercular and scale readings the age of this fish was not less than 10 years. A mortality of well over half of the large (35 cm. or more) roach is interesting, and suggests that the older and larger fishes were least able to tolerate such adverse conditions. In the size range 12 to 18 cm. none died out of a total pond population of only about 8 fishes.

Looking at table 2, one is immediately struck by the fact that most of the intermediate sizes of both pike and roach are missing and I should like to suggest how this may have come about and how predation may take place in certain undisturbed ponds.

This pond has certainly not been fished for 5 years. In 1903 and 1905 two pike were caught, both approximately 97 cm. in length and in 1917 a pike of 106 cm. and weighing just under 9 kg. was taken. It is also known that several pike were caught 8 or 9 years ago. An account also exists of a roach of 1.59 kg. being caught in 1935.

The first 15 pike in table 1 and one live pike in table 2 all exceed 48 cm. in length and their normal diet would be medium sized fishes.

According to Dr. W. E. Frost (personal communication), from an early age pike always take their prey by grabbing it mid-way along its length and making use of their backwardly directed teeth, turn the victim in the jaws so that it goes down the wide throat headfirst.

The 20 or so large roach in the pond had a body depth of 18 to 23 cm. and were obviously too large to be taken by the pike. Growth rates for roach differ according to locality. Hartley (1947) gives a figure for the Norfolk Broads of 27 cm. length at 9 years. In Germany, fast growers reach 23 cm. in 7 years. It is also thought that the girth increases with age after the fish has ceased to increase appreciably in length. The length distribution of the roach suggests that for several years only individuals beyond a certain size have escaped the predators in the pond. The very small number of 12 to 18 cm. individuals were probably hard put to continue to escape from the large pike and were obviously in good physical condition.

Of the roach of 5 to 12 cm. numbers were difficult to estimate, and the figure of 1,000 might well have been a serious under-estimate. The 45 or so that died comprised a very small proportion of the total population and all the survivors had left the shallows long before the larger fish moved out. Obviously, spawning conditions in the pond are good, as additional predators in the form of birds and the large eel population, must be taken into account.

At least 22 pike 45 cm. or more in length were present. These would feed predominantly on medium sized roach and pike, and would no doubt account for the absence, or near absence, of roach 12 to 35 cm. in length, and also for the very small numbers of pike of a length 30 cm. or less. These smaller pike appeared to be more active, and able to tolerate the adverse conditions better than their larger brethren.

Of the eels mentioned above, these were in great evidence but were so massed together to make counting impossible, but there were not less than 100 and probably 150, with a size range of 20 to 60 cm. and so far as I know not one of these died, but the number would be reduced a few weeks later, when no doubt, some of the mature ones joined the large assembly of eels that were seen on the night of October 18th 1969 in the River Ouse (1 km. away, by way of a near-by drain) on the first stage of their journey to the sea.

To conclude; very few areas of fresh water in Britain remain unfished for a number of years, but in situations where this is the case, the predators, if in sufficient numbers,

can control the sizes of the remaining fishes by selective feeding.

With netting and trapping, it will be interesting to see the effects of the reduced pike population on the roach over the next year or two. Certainly the mallard ducks (*Anas platyrhynchos*) have reared more chicks to maturity during 1970 than in the immediately preceding years.

SUMMARY

An account is given of a sudden overturn in a fresh water pond, setting out some of the contributory factors, and its effect on the fishes is described. On the basis of the size distribution of the fishes present, a suggestion is made concerning the influence of large predators on the survival and size range of their prey.

ACKNOWLEDGEMENTS

I should like to thank especially Dr. G. Fryer for his encouragement, help and his many suggestions and helpful criticisms on reading this paper, and Dr. D. J. Boatman for his interest and help, also Dr. R. Goulder and Dr. W. E. Frost with whom I had discussions, and Miss Hardman for scale and bone readings. May I also thank Mrs. M. F. Withers for her care and precision in typing the manuscript.

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F. A. LEES' BOTANICAL COLLECTIONS: PART 3

M. R. D. SEAWARD

This article represents the third (see Seaward, 1967, 1968) in a series of papers relating to the extant collections of F. A. Lees (1847-1921). This paper deals with his Yorkshire lichen collection (cf. Seaward, 1968, p.135 for details of Lincolnshire lichens) now housed in the Cartwright Hall, Bradford.

Through the courtesy of the Director of the Cartwright Hall I have been able to work on the collection during the past two years. Assisted by Miss M. Hartley, it has been possible for me to re-packet all the material. The determinations have been verified (and corrected in many instances) and brought into line with modern trends in classification. The collection and following lists, (with the exception of *Alectoria positiva* and *Ramalina reagens*), are classified according to James (1965, 1966).

The material collected from vice-counties 63, 64 and the Sedbergh/Dent/Wharfedale area of 65 coincides to a large extent with the records in *The Flora of West Yorkshire* (Lees, 1888). It has thus been possible to cross-reference the determinations with the published records and to append the amendments at the end of the following herbarium lists.

It is noted with regret that this collection has not been worked upon since its purchase in 1905, and that Watson (1946) merely accepts the Lees' determinations *en bloc* and uses them as an integral part of his paper *The Lichens of Yorkshire*. Furthermore, the herbarium material listed below that was collected from the major area of vice-county 65, and not incorporated in *The Flora of West Yorkshire*, would have provided a valuable contribution to Watson's lists (1946, 1953) had it been utilized. The following are vice-county records for 65 (cf. Watson, 1946 and 1953, denoted by A and B respectively):

- Alectoria positiva* – additional to A & B
Arthopyrenia fallax – as *A.epidermidis* in B
Caloplaca aurantiaca – A, B
Cetraria chlorophylla – A, B
Cladonia cervicornis – A, B
Collema cristatum – A, B
C.multipartitum – A, B
C.polycarpon – A, B
C.subfurvum – A, B
Collema tenax var. *vulgare* – A, B
Dermatocarpon rufescens – B
Haematomma coccineum – A
Lecanora chlorotera – A, B
Lecidea auriculata – A, B
Ramalina reagens – additional to A & B
Toninia coeruleonigricans, – A, B
Usnea distincta – A, B

I wish to acknowledge the help afforded to me by Miss M. Hartley and Mr. S. W. Feather in the interpretation of the packet hand-writing and in the localization of some of the collecting areas, and to Mr. F. H. Brightman, Dr. U. K. Duncan, Mr. D. L. Hawksworth, Mr. P. W. James, Mr. J. R. Laudon, Mr. S. A. Manning, Dr. T. D. V. Swinscow and Mr. A. E. Wade for their assistance in the determination or confirmation of the more critical material.

MATERIAL COLLECTED BY F. A. LEES:

- Alectoria chalybeiformis* (L.) Gray (64) Hesletine Ghyll, 1877.
A.fuscescens Gyeln. (65) Rigg's House, Cotter Force, 1884; (65) Lower Widdale, 1884
A. positiva (Gyeln.) Motyka (65) Nr. Hardrow, 1884, (65) Clough Wood, Fossdale, 1884
Anaptychia ciliaris (L) Korb. (65) Burtsett 1884; Green Mea (65) Gill, Askrigg, 1884; (65) nr. Appersett, 1884; 65 Hawes 1884
Arthopyrenia conoidea (Fr.) Zahlbr. (65) Cotter Beck, 1884
Baeomyces rufus (Huds.) Rebent. (64) Spofforth Station, 1881
Caloplaca aurantia (Pers.) Hellb. (65) Aysgarth, 1885
C.aurantiaca (Lightf.) Th.Fr. (65) Hardrow Force, 1884
C.ferruginea (Huds.) Th.Fr. (65) Between Hawes & Appersett, 1884
C.heppiana (Müll.Arg.) Zahlbr. (65) Simonside, 1884.
Candelariella vitellina (Hoffm.) Müll.Arg. (65) Between Hawes & Appersett, 1884
Cetraria chlorophylla (Willd.) Vain. (65) Simonstone, 1884; (65) Hardrow Force, 1884
C.glaucula (L.) Ach. (64) Brimham Moor, 1881; (64) Hebden Valley, 1879; (65) between Burtsett & Gayle, 1884; (65) nr. Hardrow Force Fell, 1884; (65) Mill-gill Force 1884
C.islandica (L.) Ach. (64) Bowland Knotts, n.d.
Cladonia arbuscula (Wallr.) Rabenh. (64) Askham Bog, 1878
C.cervicornis (Ach.) Flot. (65) Lovely Seat, 1884
C.furcata (Huds.) Schrad. (64) Nr. Stutton, 1880
C.pocillum (Ach.) O.J. Rich. (64/65) Whernside, 1884; (65) nr. Hardrow Force, 1884
C.polydactyla (Flörke) Spreng. (64) Brimham Moor, 1881; (65) Widdale Carr, 1882 & 1887
C.pyxidata (L.) Hoffm. (64) Jackdaw Crag, 1880
C.rangiformis Hoffm. (64) Rigton, 1880; (64) Jackdaw Crag, 1881
C.tenuis (Flörke) Harm. (64) Jackdaw Crag, 1880
C.uncialis (L.) Web. (64) Harlow Heath, Harrogate, 1880
Collema cristatum (L.) Web. (65) Hardrow Scar Gorge, 1884; (65) Cotterdale Head, 1884; (65) Mossdale Head, 1884; (65) Green Mea Gill, 1884
C.fluviatile (Huds.) Steud. (64) Douk Ghyll, 1879
C.multipartitum Sm. (65) Green Mea Gill, 1884; (65) West Gill, Cotterdale, 1884; (65) Askrigg, 1884
C.polycarpon Hoffm. (65) Hardrow Scar Gorge, 1884; (65) Green Mea Gill, 1884
C.subfurvum (Müll.Arg.) Degel. (65) Hardrow Scar, 1884; (65) Green Mea Gill, 1884
C.tenax (Sw.) Ach. (64) Jackdaw Crag, 1880; (64) nr. Wetherby, 1880; (65) nr. Appersett, 1884
 var. *ceranoides* (Borr.) Degel. (64) Jackdaw Crag, 1880
 var. *vulgare* (Schaer.) Degel. (65) Gayle, 1884
C.tunaeforme (Ach.) Ach. ex Degel. (64) Douk Ghyll, 1879; (64) Ling Ghyll, 1879; (64) Jackdaw Crag, 1880; (64) Rigton, 1880
Cornicularia aculeata (Schreb.) Ach. (63) Hebden Valley, 1879; (65) Lovely Seat, 1884
Dermatocarpon minutum (L.) Mann (64) Douk Ghyll, 1879; (64) Jackdaw Crag, 1880; Hardrow Scar Force, 1883 & 1884; (65) Green Mea Gill, 1884; (65) Arngill Head, 1884
D.rufescens (Ach.) Th.Fr. (65) Hardrow Force, 1884
Diploschistes scruposus (Schreb.) Norm. (65) Bainbridge, 1884; (65) Hardrow Force, 1884

- Evernia prunastri*(L.)Ach. (64) Brimham Moor, 1881; (65) Hardrow Scar, 1884; (65) Arngill, 1884
- Graphina anguina*(Mont.)Müll.Arg. (65) nr. Cotter Force, 1884
- Graphis scripta*(L.)Ach. (65) nr. Appersett Bridge, 1884
- Haematomma coccineum*(Dicks.)Körb. (65) Simonstone, 1884; (65) Abbotside Common, n.d.
- Lecanora atra*(Huds.)Ach. (65) Green Mea Gill, 1884; (65) nr. Gayle, 1884
- L.chlarotera* Nyl. (65) Whitfield Gill, 1884; (65) Aysgarth, 1885
- L.rupicola*(L.)Žahlbr. (65) nr. Gayle, 1884
- Lecidea auriculata* Th.Fr. (65) Fall Head, Gayle, 1884
- L.crustulata*(Ach.)Spreng. (65) Widdale Fell, 1884
- L.dicksonii*(J.F.Gmel.)Ach. (65) nr. Appersett Bridge, 1884
- L.lucida*(Ach.)Ach. (65) Sedbergh, 1887
- L.lurida*(With.)Ach. (65) Cotterdale House Cavern, 1884
- L.macrocarpa*(DC.)Steud. (63) nr. Cullingworth, 1887; (64) Hookstone Crag, nr. Harrogate, 1880; (65) Duerley Brook, Gayledale, 1884; (65) Rigg's House, Cotter Force, 1884
- Lepraria membranacea*(Dicks.)Vain. (64) Clapham, 1884
- L.xantholyta*(Nyl.)Lett. (64) Clapham, 1887; (64) Ingleton, 1887
- Lobaria amplissima*(Scop.)Forss. (65) Lower Cotterdale, 1884
- L.laetevirens*(Lightf.)Zahlbr. (64/65) Whernside, 1878; (65) Hardrow Force, 1884
- L.pulmonaria*(L.)Hoffm. (65) Lower Widdale, 1884; (65) nr. Cotter Force, 1884; (65) Bain Gill, 1884 & 1885
- Ochrolechia parella*(L.)Massal. (65) Gayle, 1884; (65) nr. Hardrow Force, 1884
- O.tartarea*(L.)Massal. (65) Arngill, 1885
- Opegrapha saxicola* Ach. (64) Rigton, 1880; (64) Bramham, n.d.
- Parmelia caperata*(L.)Ach. (62) Castle Howard, 1880; (65) Skellgill, Askrigg, 1884
- P.furfuracea*(L.)Ach. (64) Brimham Moor, 1881; (65) Low Haygarth, 1887; (65) nr. Gayle, 1884; (65) Simonstone House, 1884; (65) Millgill, Askrigg, 1884
- P.glabratula* subsp. *fuliginosa*(Fr.ex Duby)Laund. (65) Askrigg, 1884
- P.omphalodes*(L.)Ach. (64/65) Whernside, 1878; (65) nr. Gayle, 1884; (65) nr. Burtersett; (65) Semerwater, 1884
- P.physodes*(L.)Ach. (64) Douk Ghyll, 1879; (64) Ling Ghyll, 1879; (65) Litherskew Wood Gill, 1884; (65) nr. Gayle, 1884; (65) Millgill, Askrigg, 1884; (65) Hardrow, 1884
- P.saxatilis*(L.)Ach. (65) Hardrow Scar, 1884
- P.subaurifera* Nyl. (64) Giggleswick to Austwick, 1886; (65) Askrigg, 1884; (65) Whitfield Gill, 1884; (65) nr. Simonstone, 1884; (65) nr. Gillside, Litherskew, 1884
- P.tiliacea*(Hoffm.)Ach. (65) Low Haygarth, 1887; (65) Skellgill, 1884; (65) Simonstone, 1884; (65) Askrigg, 1884;
- P.tubulosa*(Schaer.)Bitt. (64) Douk Ghyll, 1879; (65) nr. Gayle, 1884
- Peltigera canina*(L.)Willd. (64) Aketon, 1884; (65) between Askrigg & Nappa Hall, 1884; (65) Hardrow Scar Gorge, 1884
- P.horizontalis*(Huds.)Baumg. (64) Linn Ghyll 1879; (65) Lower Cotterdale, 1884; (65) nr. Cotter Force, 1884
- P.rufescens*(Weiss)Humb. (65) Whitfield Gill, 1884
- Pertusaria corallina*(L.)Arnold (65) nr. Gayle, 1884
- P.pertusa*(L.)Tuck. (65) Masham, 1880; (65) Hardrow, 1884
- Physcia ascendens*(Th.Fr.)Oliv.em.Bitt. (65) Cotterdale, 1883; (65) Millgill Gorge, 1884; (65) Simonstone, 1884; (65) nr. Askrigg, 1884; (65) nr. Gayle, 1884; (65) Burtersett, 1884; (65) Leyburn, 1884
- P.aipolia*(Ehrh.ex Humb.)Hampe (65) Millgill Gorge, 1884; (65) Simonstone, 1884; (65) Burtersett, 1884
- P.pulverulenta*(Schreb.)Hampe (65) nr. Appersett, 1884; (64) Giggleswick to Austwick, 1887
- Placynthium nigrum*(Huds.)Gray (65) Bowbridge, Askrigg, 1884
- Protoblastenia rupestris*(Scop.)Steiner (65) nr. Gayle, 1884
- Ramalina calicaris*(L.)Fr. (61) Danes Dyke, Flamborough, 1881
- R.farinacea*(L.)Ach. (61) Danes Dyke, Flamborough, 1881; (65) Hardrow Scar, 1884; (65) nr. Gayle, 1884; (65) Lower Widdale Gill, 1884
- R.fastigiata*(Pers.)Ach. (65) Hardrow Scar, 1884
- R.fraxinea*(L.)Ach. (65) Hardrow Scar, 1884; (65) Lower Widdale, 1884
- R.reagens*(Lesd.)Culb. (65) nr. Skellgill, 1884

- Rhizocarpon geographicum*(L.)DC. (65) Howgill, 1879; (65) Widdale Fell, 1884; (65) nr. Gayle, 1884; (65) Lovely Seat, 1884; (65) nr. Cotter Force, 1884; (65) Simonstone, 1884; (65) Cautley Spout, 1884
R.petraeum(Wulf.)Massal. (65) Cotter Force, 1884; (65) nr. Gayle, 1884; (65) Widdale, 1884; (65) Askrigg Common, 1884
R.umbilicatum(Ram.)Flag. (65) Dodd Fell & Ten End, 1884
Solorina saccata(L.)Ach. (64) Douk Ghyll, 1879; (64) Rigton, 1880; (64) Stubbing Moor, n.d.; (65) Askrigg, 1884
Sphaerophorus globosus(Huds.)Vain. (63) Hebden Valley, 1879; (65) Upper Cotterdale, 1884; (65) Lower Shaw, 1884
S.melanocarpus(Sm.) DC. (64) Douk Ghyll, 1879
Squamarina crassa(Huds.)Poelt (64) Thorns End, Ribbleshead, 1879; (65) Green Mea Gill, 1884; (65) Askrigg, 1884
Teloschistes flavicans(Sw.)Norm. (64) Malham Cove, 1880
Thelidium decipiens(Nyl.)Kremp. (65) Burtsett to Gayle, 1884
Thelotrema lepadinum(Ach.)Ach. (64) Bolton Woods, 1883
Toninia coeruleonigricans(Lightf.)Th.Fr. (64) Gordale, 1870; (64) Jackdaw Crag, 1880; (65) Abbotside Common, 1884; (65) Stag's Fell, Hawes, 1885
Umbilicaria polyphylla(L.)Baumg. (65) nr. Gayle, 1884; (65) Skellgill, 1884
Usnea distincta Motyka (65) Cotterdale, 1884
U.subfloridana Stirt. (65) Hardrow Scar Force, 1884; (65) Bain Gill, 1885
Verrucaria muralis Ach. (64) Jackdaw Crag, 1880
V.sphinctrina Ach. (65) nr. Gayle, 1884
Xanthoria parietina(L.)Th.Fr. (65) Skellgill, 1884; (65) Arngill, 1884; (65) Gayle, 1884

MATERIAL COLLECTED BY W. WEST:

- Arthopyrenia fallax*(Nyl.)Arnold (65) Dentdale, 1881
Bacidia sabuletorum(Schreb.)Lett. (65) Dentdale, n.d.
Buellia canescens(Dicks.)DNot. (64) Knaresborough, n.d.
Caloplaca hepiana(Müll.Arg.)Zahlbr. (64) nr. Malham, 1879; (64) Ingleton, 1883; (64) Clapham, 1885
Cetraria glauca(L.)Ach. (65) Baugh Fell, 1879
Collema cristatum(L.)Web. (64) nr. Clapham, 1887
Dermatocarpon rufescens(Ach.)Th.Fr. (64) Ingleborough, 1883
Evernia prunastri(L.)Ach. (65) Dentdale, 1879
Graphis elegans(Borr.ex Sm.)Ach. (65) nr. Sedbergh, 1879
G.scripta(L.)Ach. (65) Rawthey-dale, 1879
Gyalecta jenensis(Batsch)Zahlbr. (64) Kettlewell, 1880; (64) Malham, 1882
Lecanora chlorotera Nyl. (65) Baugh Fell, 1879
Lecidea lurida(With.)Ach. (64) Ingleton, 1883
Mycoblastus sanguinarius(L.)Norm. (64) Newsholme Dean, Keighley, n.d.
Ochrolechia parella(L.)Massal. (65) Dent, 1879
Parmelia perlata(Huds.)Ach. (65) Dent, 1879
P.revoluta Flörke (64) Ingleton, 1883
P.saxatilis(L.)Ach. (65) Dentdale Head, 1879
P.sulcata T.Tayl. (65) Dentdale, 1879
P.tiliacea(Hoffm.)Ach. (65) Dentdale, 1881
Physcia adscendens(Th.Fr.)Oliv.em.Bitt. (65) nr. Baugh Fell, 1879
P.aipolia(Ehrh.ex Humb.)Hampe (64) Hawkswick to Kilnsey, 1881
P.caesia(Hoffm.)Hampe (65) Baugh Fell, 1879
Placopsis gelida(L.)Lindsay (64) Malham, 1881; (64) Ingleton, 1882
Ramalina farinacea(L.)Ach. (65) Dentdale, 1879
R.fastigiata(Pers.)Ach. (65) Dentdale, 1879
R.fraxinea(L.)Ach. (65) Dentdale Head, 1879
Solorina saccata(L.)Ach. (64/65) Whernside, 1878; (64) nr. Gordale, 1879
Sphaerophorus globosus(Huds.)Vain. (64/65) Whernside & Howgill Fells, 1879
Squamarina crassa(Huds.)Poelt (65) Baugh Fell, 1879
Umbilicaria polyphylla(L.)Baumg. (65) Grisdale Beck, Moorcock Inn, 1879
Verrucaria nigrescens Pers. (65) Dent, 1879
Xanthoria parietina(L.)Th.Fr. (65) Dent-head, 1879

MATERIAL COLLECTED BY H. F. PARSONS:

- Cetraria islandica*(L.)Ach. (61) Drewton Vale, n.d.
Umbilicaria proboscidea(L.)Schrader. (65) Baugh Fell, 1882

MATERIAL COLLECTED BY H. F. PARSONS & W. WEST:

Lecidea macrocarpa(DC)Steud. (64/65) Whernside, 1879

MATERIAL COLLECTED BY W. FOWLER:

Cetraria glauca(L.)Ach. (64) Baildon Glen, 1879

MATERIAL COLLECTED BY C. E. DEKANCE:

Solorina saccata(L.)Ach. (65) Cotterdale, 1883

MATERIAL ATTRIBUTED TO COLLECTIONS MADE BY A. CARR IN THE RIVELIN VALLEY AREA, NEAR SHEFFIELD (c.1880):

Cetraria glauca(L.)Ach., *Cladonia chlorophaea*(Florke ex Sommerf.)Spreng., *C.furcata*(Huds.)Schr., *C.polydactyla* (Florke)Spreng., *Cornicularia aculeata*(Schreb.)Ach., *Parmelia omphalodes*(L.)Ach., *P.physodes*(L.)Ach., and *Sphaerophorus globosus*(Huds.) Vain.

CORRECTIONS TO "THE FLORA OF WEST YORKSHIRE" (PAGE REFERENCES IN PARENTHESES):

- a. Some nomenclatural revisions: *Cladonia rangiferina* (p.636 & pp.806-807) – all packets labelled thus are either *C.arbuscula* or *C.impexa* or *C.rangiformis* or *C.tenuis*. No *C.rangiferina* from Yorkshire has been seen in the collection. *Parmelia olivacea*(pp.641-642 & p.807) – all packets labelled thus proved to be either *P.glabratula* or the subsp. *fuliginosa* or *P.subaurifera*. *Physcia stellaris*(p.644) – all packets labelled thus proved to be either *P.adscendens* or *P.aipolia* or *P.caesia* or *P.pulverulenta*.
- b. Add: *Alectoria chalybeiformis* (p.807 as *A.jubata* var. *chalybeiformis*) W. Hesletine Ghyll.
Baeomyces rufus(p.634) N.Spofforth.
Cetraria glauca(p.639 as *Platysma glaucum*) N.Brimham Moor.
Cladonia arbuscula(p.806 as *C.sylvatica*) W. Askham Bog.
C.pocillum L.Whernside.
C.polydactyla N.Brimham Moor.
C.rangiformis W. Ripton & Jackdaw Crag.
C.tenuis W.Jackdaw Crag.
Collema cristatum(L.)Web. L.nr. Clapham.
C.fluviatile(Huds.)Steud.(p.632) R.Douk Ghyll.
C.tenax (Sw.)Ach.var.*ceranoides*(Borr.)Degel.(p.632 as *C.ceranoides*) W.Jackdaw Crag.
C.tunaeforme(Ach.)Ach.ex Degel. R.Douk Ghyll & Ling Ghyll.
Cornicularia aculeata(Schreb.)Ach.(p.639 as *Cetraria aculeata*) C.Hebden Valley.
Graphis elegans(Borr.ex Sm.)Ach.(p.656) L. nr. Sedbergh.
Lecidea lurida(With.)Ach.(p.651) L.Ingleton.
Parmelia tubulosa(Schaer.)Bitt. R.Douk Ghyll.
Physcia aipolia(Ehrh.ex Humb.)Hampe(p.808) W.Hawkswick to Kilnsey.
P.caesia(Hoffm.)Hampe L.Baugh Fell.
P.pulverulenta(Schreb.)Hampe(p.644) L.Giggleswick to Austwick.
Teloschistes flavicans(Sw.)Norm.(p.643 as *Physcia flavicans*)A.Malham Cove.
- c. Delete: *Collema crispum*(Huds.)Ach.(p.632) W.Wetherby.
C.melaenum Ach.(p.632) W.Jackdaw Crag.
Endocarpon fluviatile DC.(p.658) R.Ling Gill.
Graphis scripta(L.)Ach.(p.656) L.Sedbergh.

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THE LICHEN *PARMELIA INCURVA* (Pers.)Fr. IN YORKSHIRE

M. R. D. SEAWARD

Parmelia incurva (Pers.)Fr. (= *P. multifida* A.L.Sm.) is a well known circumpolar saxicolous species first described from the British Isles (Hale & Kurokawa, 1962). In the British Isles the species is to be found mainly on outcrops and walls of millstone grit and granite. Its distribution is rather rare and local, and its incidence in terms of vice-county records does not truly indicate its scarcity. Watson (1953) records this species from 17 vice-counties which are widely spread across the British Isles but absent from the south and east of England (viz. 35, 48, 50, 52, 55, 66-68, 73, 83, 92, 96; H 1, 2, 20, 21, 39).

In July 1970, the writer recorded *Parmelia incurva* from a millstone grit wall bordering a coniferous plantation on Stainburn Moor (GR: 44/234.523). Several rosettes 1.5 cm. in diameter were found on the top of the 1.3 m. high wall for a length of 6 m. at an elevation of 245 m. The rosettes were growing in association with the lichens *Cetraria glauca*, *Haematomma ventosum*, *Lecanora conizaeoides*, *L. intricata* var. *soralifera*, *L. polytricha*, *Lecidea lapicida*, *L. tumida*, *Parmelia gladratula* subsp. *fuliginosa*, *P. physodes*, *P. saxatilis*, *P. tubulosa* and *Rhizocarpon obscuratum*. Bryophytes and the lichen *Lepraria incana* were confined to peaty pockets between the building stones. This is only the second record for *Parmelia incurva* in Yorkshire. There are no records in Watson (1946); the first record was made during the British Lichen Society mapping programme from grid square 34/77 by the Rev. G. G. Graham in September 1966.

As a result of the British Lichen Society mapping scheme, a renewed interest in lichen distribution studies has developed. Since 1960, over 1,000 ten-kilometre grid squares (representing approximately a one-third coverage of the British Isles) have been investigated, and mapping cards prepared. *Parmelia incurva* has been recorded from 19 of these squares, and appears to be quite tolerant to air pollution and well suited to millstone grit. Nine new vice-county records have also been provided through the mapping scheme, and together with the records from Derbyshire (see Hawksworth, 1969), a revised vice-county distribution is as follows: 3, 35, 40, 48, 50, 52, 55, 57, 64, 66-69, 73, 83, 85, 90, 91, 92, 96, 102, 105, 108; H1, 2, 20, 21, 39. Further vice-county records are anticipated especially from Wales and Scotland. It is locally abundant on Charnian rocks in Leicestershire (Sowter, 1950; Hawksworth & Sowter, 1969) and occurs locally on granite in Dartmoor (Hawksworth, *in litt.*). In Scotland it occurs chiefly on granite and quartz in upland areas; in Ireland its present status is unknown – there are no recent records.

I should like to record my thanks to Dr. D. L. Hawksworth for his confirmation of my determination of *Parmelia incurva*.

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John Moore's England chosen and edited by **Eric Linklater**. Pp. 192. Collins, 1970. 30/-.

In contrast to modern environmental studies this book tells of a bygone England. After the fury and furore of pollution in all its forms, a return to a world of village green cricket, unspoiled countryside and rural life formed an amazing contrast. And all this comparatively recently too – credibility is stretched to its limit when one realises that the two worlds are only forty or fifty years apart.

This is country writing of a very high calibre and the selection and editorship of Eric Linklater make it flow evenly throughout. There are passages which recall T. H. White's work very strongly. A book to read as an antidote to present day turmoil.

T.M.C.

FIELD NOTES

Cicuta virosa L. in West Yorkshire

In October 1969 Mrs. E. M. S. Newfield and Miss C. M. Holmes discovered *Cicuta virosa* in a marsh near Green Hammerton. The plant was correctly identified and recorded in the botanical report of the Harrogate and District Naturalists' Society, though at the time the importance of the discovery was not realised. Mrs. W. G. Haythornthwaite visited the site in August 1970 and sent me a specimen, and on 20 August she kindly took me to the locality.

The site was evidently at one time a pond which has gradually been converted into a marsh by the accumulation of organic matter and been invaded by shrubs of *Salix cinerea* and marsh plants, no open water now remaining. Many massive plants of *Cicuta virosa* are present in the marsh, other species present being:-

<i>Lotus uliginosus</i>	<i>Urtica dioica</i>
<i>Potentilla palustris</i>	<i>Rumex conglomeratus</i>
<i>Epilobium hirsutum</i>	<i>Salix cinerea</i>
<i>E. palustre</i>	<i>Juncus effusus</i>
<i>Galium palustre</i>	<i>Iris pseudacorus</i>
<i>Solanum dulcamara</i>	<i>Sparganium erectum</i>
<i>Polygonum hydropiper</i>	<i>Carex paniculata</i>

Cicuta virosa is one of those marsh plants which, formerly more widespread, has become progressively rarer and more restricted in distribution on account of drainage and intensive agricultural developments. According to the *Atlas of the British Flora* the only English localities in which it survives are in the fen district of East Anglia and the Cheshire and Shropshire meres. Lees (*Flora of West Yorkshire*, 252 : 1888) discounted West Yorkshire records from where no specimens are known to exist in herbaria. It was however probably not uncommon long ago, before systematic recording began, since Dr. D. D. Bartley (*New Phytol.*, 61, 277-287 : 1962) has recorded *Cicuta* fruits in post-glacial lake deposits at Oxtun near Tadcaster. The North Riding station at Newsham Carr had been destroyed by drainage before the end of last century and Lees (*Supplement to Yorkshire Floras*, 52: 1941) also stated categorically that it had gone from the Ainderby Carr locality in North Yorkshire and from the East Riding stations from where the last certain record was made in 1870.

Apart from the importance of this rediscovery of a plant which had not been seen anywhere in Yorkshire during the present century, this record is of great interest as showing how in a district rarely visited by botanists on account of its being almost wholly agricultural country, isolated areas of botanical importance may yet survive. In addition to the *Cicuta*, *Carex paniculata*, of which several very large tussocks are present, was also unrecorded for this 10 km. square.

W. A. SLEDGE

Parapholis incurva on Spurn Head

During fieldwork on Spurn Head in June 1970 *Parapholis incurva* (L.) Hubbard (Curved Sea Hard-grass) was found growing in abundance on an area of mud flats due east of the Chalk Bank. Previously unrecorded in Yorkshire and almost fifty miles from its nearest locality at Gibraltar Point in Lincolnshire, the Spurn locality constitutes its most northern British station. A mean anther length of 0.8 mm. confirmed that the grass was *Parapholis incurva* and not *P. strigosa*.

The grass is present throughout the length of the mud flats between the Chalk Bank and road, an area heavily grazed by rabbits and generally every dry. Inundation of the area is infrequent, following high spring tides and heavy rain. It was generally found growing in sandy mud with *Glaux maritima* (Sea Milkwort), *Puccinellia maritima* (Sea Poa), *Sagina maritima* (Sea Pearlwort) and *Plantago coronopus* (Buck's-horn plantain) but was capable of tolerating very dry conditions on pure sand deposited on the flats after clearance from the road.

P. incurva might have been on Spurn for some time as its incurved narrow cylindric spikes are difficult to distinguish in the field from the grazed stoloniferous culms of *Puccinellia maritima*. On the other hand the grass was only recorded at Gibraltar Point in 1957 (Mrs. F. Watson, Observations on grasses growing in Lincolnshire. *Trans. Lincs. Nat. Union* 17, 75-84: 1969) and could be a recent arrival on Spurn, an annual plant exploiting a suitable ecological niche by rapid spread.

T. DARGIE, Botany Dept., University of Hull.

Vaccinium $\times$ *intermedium* Ruthe in V.C. 65

The hybrid, *Vaccinium myrtillus* L. $\times$ *V. vitis-idaea* L. (= *V. \times intermedium* Ruthe), first described from Germany in 1826, was first reported in the British Isles by R. Garner in an interesting illustrated paper in *Hardwicke's Science Gossip* for 1872, wherein its actual discovery was ascribed to D. Ball, F.R.C.S. It is interesting to note that when Garner exhibited specimens of the hybrid, collected in Staffordshire, to a meeting of the Linnean Society in London in 1871 'the general opinion elicited by their examination was that they were a luxuriant state of *Vaccinium vitis-idaea* due to situation rather than a hybrid.'

Its first known station in Yorkshire was near Harrogate (1893), then at a locality in the Cleveland Hills (Heslop-Harrison, 1917). Later it became well-known at a number of sites near Sheffield and at several others in V.C. 63 and 64, but so far as I am aware has never been found in V.C. 65. It was therefore with great interest that I found in April of this year, at an altitude of ca. 750', a considerable growth of the hybrid, with its parents, on the lower slopes of Agra Moor a few miles to the west of Masham in V.C. 65. Of the three plants (*V. myrtillus*, *V. \times intermedium* and *V. vitis-idaea*), only *V. myrtillus* is deciduous, so that at this time of the year (April) any *Vaccinium* without leaves can be passed over as *V. myrtillus*. The leaves of *V. \times intermedium* are of a much lighter green than those of *V. vitis-idaea*, and of an obviously thinner texture, and these differences are easily seen without close examination.

A comparative table of a few easily-observed characters follows:

	<i>V. myrtillus</i>	<i>V. \times intermedium</i>	<i>V. vitis-idaea</i>
stem shape	angled	ridged-terete	terete
stem pubescence	glabrous	puberulent	pubescent
bracteoles	absent	two	two
corolla shape	globose; lobes very short	urceolate; lobes c. $\frac{1}{3}$ length of tube	campanulate; lobes c. $\frac{1}{2}$ length of tube
calyx lobes	scarcely to be distinguished	distinct, rounded	distinct, subacute
venation of upper leaf surface	conspicuously reticulate	conspicuously reticulate	essentially simply pinnate, though some anastomosing at margin

J. C. Ritchie, in the *New Phytologist* 1955, has an important paper on this hybrid and in a table of 17 criteria for the comparison of the three plants he found that for *V. \times intermedium* eleven of the characters cited were exactly intermediate, three were similar to *V. myrtillus*, and three similar to *V. vitis-idaea*.

V. \times intermedium has thus occurred in all Yorkshire vice-counties except 61, and as *V. vitis-idaea* is not known in 61, the hybrid is also presumably absent.

I am grateful to Mr. F. E. Branson for allowing me access to *Hardwicke's Science Gossip* for the relevant year.

G. A. SHAW

Comfrey Rust in Yorkshire

On June 26th, Dr. C. J. La Touche sent me leaves of *Symphytum officinale* heavily infected with the rust *Melampsorella symphytii*. They had been collected at Alwoodley, Leeds. This led me to look at Comfrey plants which are fairly common in the Pickering area and I found a small patch of three or four plants infected. Later Dr. La Touche found the rust at Fountains Abbey, Ripon. So far as I am aware it has not been reported before from Yorkshire.

These widely separated localities pose a problem. Why has the rust not been reported before? The underside of the leaves are practically covered by the brilliant chrome-yellow uredospores and are very conspicuous. Fountains Abbey has been visited by the Mycological Committee several times. In May 1968 many plants of Comfrey were examined for another reason and no rust was seen, but this date may have been a bit early. In September 1969 again many plants were looked at with the same result. Those in the Pickering locality have been under observation for many years, averaging three or four visits per year, and I am pretty certain if the rust had been there it would have been noticed. Other stands of Comfrey visited in the area are not infected.

W. G. BRAMLEY

The Density of Common Moles on a mossland as shown by trapping.

One of the commonest mammals on mossland (flat, low-lying, drained peaty farmland) is the mole *Talpa europaea*. Most previous estimates of density have involved counts of molehills rather than moles – not an ideal method quantitatively. Recently however, Mr. Harrison of Winmarleigh College of Agriculture, Lancashire, has given us some unpublished data which gives a true indication of numbers in a very favourable area.

From January to December 1967 the cow-man trapped 1,020 moles on the 200 acres of arable and pasture land at Winmarleigh, an average density of about five moles per acre. More were taken in the lower, wetter peaty areas than the higher boulder clay areas. From January 1968 to April 1970 the pressure of trapping was maintained and a further 445 moles caught in the area. The majority of these were caught around the boundary of the farm and were probably coming into the area from surrounding farms where little or no trapping occurred. Also it was noticeable that mole activity on the trapped land had decreased markedly since 1967.

Thus, the density on the area before trapping was probably just over five per acre and when this density was lowered by trapping a large number of moles moved into the vacant places, suggesting a similarly high concentration in the surrounding fields.

M. E. and P. A. GREENHALGH, *St. Martin's College, Lancaster.*

The Populations of Common Frog and Toad at Martin Mere

As few estimates of the breeding populations of Common Frog *Rana temporaria* and Common Toad *Bufo bufo* have been recorded it appears worthwhile reporting a census made in March and April 1970 at Martin Mere, Southport, Lancashire. This is an area about one by a half mile, the remnant of a vast fenland which covered an area eight miles long between Crossens and Rufford before most was drained in the 18th Century. An area of *Phragmites* with willow, rush and sedge, it is unfortunately being rapidly drained and a plan has been put forward to make a 'Leisure Centre' over the area.

Peak spawning frog numbers were reached on 21 March, when we counted about 5,050 along 570 yards of drainage channel, and estimated not less than 14,000 along the total of 1,580 yards of channel. About 60% were paired and spawning at the time. The frogs had completed spawning by mid-April when we estimated 770 spawn masses along the 1,580 yards of channel. Although this is a very rough estimate, it indicates that a large percentage of the frogs present in March did not spawn in the channels.

The peak for spawning toads was on 14 April. Toads were everywhere, on roads, in fields, through reed beds as well as in the drainage channels. Along the 1,580 yards of channel 1,490 were counted, about 30% being paired. We also made two transects of 1,900 yards through the area and from this estimated a minimum of 4,000 toads out of the water. Thus at least 5,500 were breeding in the area.

It appears that 1970 was a good year for breeding frogs and toads in this part of Lancashire. At Leighton Moss, M.E.G. has never seen so many along the channels dissecting the reed beds whilst even in quite small ponds in the county, numbers have been high.

MALCOLM E. and MARY GREENHALGH, *St. Martin's College, Lancaster.*

Tiphia femorata (Tiphidae, Hymenoptera) taken in Yorkshire

A male *Tiphia femorata* was taken at York on 22 August 1968. This is a new county record and probably a new record for the north of England. The British Museum (Natural History) has records of this wasp being taken in Pembrokeshire, Norfolk, Suffolk, Essex, Berkshire, Kent, Surrey, Hampshire and Devon.

The life history of this wasp probably illustrates an early phase in the evolution of the habits of the solitary wasps. According to Richards (Handbooks for the Identification of British Insects Vol. VI Part 1, 1956) the wasp preys on the larvae of the Scarabaeidae: Coleoptera. Malyshev (Genesis of the Hymenoptera and the Phases of their Evolution, Methuen, 1968) states that the female usually digs in sandy soil looking for beetle larvae. The beetle larva is paralysed in the thorax and the egg laid in the transverse fold between two neighbouring segments, from the second to the fifth segment. No burrow or cell is prepared by the wasp and the beetle larva recovers and continues to feed and grow. Movement of the beetle larva sometimes crushes and kills the egg.

MICHAEL ARCHER

RARE SPIDERS FROM THE DONCASTER AREA

COLIN A. HOWES

During 1969 it became necessary, for the purpose of conservation, to document the natural history of various sites in the Doncaster area. Extensive collecting was carried out during the year with some attention being paid to the Arachnida which, for some time, has been a grossly neglected group in Yorkshire, with a significant paucity of records from the eastern part of V.C.63. Preliminary collecting on Thorne Moors - 7,000 acres of acid bog, sallow carr and fen of great botanical and entomological importance - together with limited work on the recolonised gravel pits at Blaxton Common, soon revealed several interesting spiders.

Singa pygmaea (Sundevall) a startlingly conspicuous species with a glossy, humbug-like, brown and yellow banded abdomen, was taken by E. W. Aubrook from an area of *Holcus* sp. at Blaxton Common on the 25th June. This represented a new V.C. 63 record and only the third record for Yorkshire, having been collected twice before on Allerthorpe Common. The first record was of a female collected by T. Stainforth in June 1920, followed by another female collected during a Y.N.U. Field Meeting on 6th June, 1927.

Although most of Thorne and its contiguous moors is basically acid bog, a history of peat cutting has provided many 'micro habitats' ranging from the dry Bracken and Birch-clad peat banks, to the flooded, freshly-dug, peat workings with every stage of the hydrosere from open water to Birch-dominated moor. Resulting from the subtle variations in habitat, the arachnid fauna, though characteristic of peat bog conditions, seems remarkably varied. To date, some eleven species of Lycosid (wolf) spiders have been separated from those so far collected. A noteworthy species, was a female *Pirata piscatorius* (Clerck) collected on the 10th August - a new record for V.C.63 and only the second record for Yorkshire, the first being a female collected on Allerthorpe Common by T. Stainforth in 1919.

As striking as the myriads of Lycosid spiders, so characteristic of the Thorne Moors ground fauna, were the huge Araneas. Seven species were in evidence from July to October, their enormous webs, exceeding six feet in diameter in the case of *A. quadratus* Clerck, stretching between the young birches, sallows, oak saplings and the taller growths of *Calluna* and *Vaccinium*. Almost predictably the spectacular yellow and chocolate *Araneus marmoreus* var *pyramidatus* (Clerck) was present in abundance from August to October. Although widespread in Britain, being recorded in some thirty counties, this is a rather uncommon and local spider, seeming to require conditions where acid bog or moor is being colonised by birch. In V.C.63 it is only known from Thorne Moors, specimens being collected during the Y.N.U. visit to the area on 3rd August 1946. Other Yorkshire localities are Bishop Wood, Grass Wood and Dalton Lane in V.C.64; Strensall Common in V.C.62; and Allerthorpe Common and Skipwith Common in V.C.61.

The very rare *Araneus marmoreus* (Clerck) was frequently met with among the taller growths of *Calluna* and *Vaccinium* and low shrubby birches. Apart from being a new record for V.C. 63, the occurrence of *A. marmoreus* (Clerck) on Thorne Moors represents only the third British locality, all of which are in Yorkshire - the others being Allerthorpe Common and Skipwith Common.

It is clear from the results of limited and largely casual collecting during 1969, that a closer study of the areas mentioned would undoubtedly reveal other rare and interesting species.

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YORKSHIRE NATURALISTS' UNION EXCURSIONS IN 1970

SKIPWITH COMMON, V.C. 61 – 23rd to 25th May

The Whitsuntide Meeting, for which we had three days of glorious sunshine, followed a long spell of cold weather and the plant life was all late in development. The ornithologists, however, had an excellent weekend. Mr. Eric Chicken, the Divisional Secretary, had prepared a most helpful map of the Common which enabled us to find our way into three different areas, so that members really had an opportunity to explore the whole of this extensive lowland bog and heath.

Over sixty members were present on at least one of the days and twenty attended the tea and meeting for reports at the 'Hare and Hounds', Skipwith, when the Chair was taken by Mr. Atholl Wallis. Eighteen member societies were represented over the whole weekend. Twenty-five new members were proposed and seconded at this meeting. Mr. G. Shaw expressed the thanks of all those who had been present to the Divisional Secretary, for his organisation of the weekend's activities and to the Yorkshire Naturalists' Trust, which granted the Union access to the Common.

Ornithology (J. HESSLEWOOD)

Once again Mr. Chicken's maps were of great value and the ornithologists were able to visit the varied habitats without becoming lost. The weather was very favourable and a total of 65 species was recorded over the three days.

Willow Warblers were very common and were singing almost everywhere and Tree Pits gave excellent views of parachute song flight. Nightjars were heard and seen and Woodcock was recorded roding. No owls were seen but raptors were represented by Kestrel and a female Sparrow Hawk. Black-headed Gulls were nesting on many pools and Mallard, Teal, Shoveler, Tufted Duck, Moorhen, Coot and Heron were also seen here. Woodland species were well represented with Green Woodpecker, Blackcap, Garden Warbler, Whitethroat, Lesser Whitethroat, Robin, Blackbird, Song Thrush and Mistle Thrush being recorded. Chaffinch, Greenfinch, Goldfinch, Bullfinch, Linnet, Redpoll, Tree Creeper, Willow Tit, Blue Tit, and Great Tit were also present. The absence of Redstart was commented upon by many members and it was thought the Jay population contributed to the low number of Wood Pigeons.

Other birds recorded were Red-legged Partridge, Partridge, Pheasant, Lapwing, Snipe with young, Herring Gull, Turtle Dove, Cuckoo, Swift, Skylark, Wren, Sand Martin, Swallow, House Martin, Meadow Pipit, Pied Wagtail, Dunnock, Sedge Warbler, Reed Warbler, Whinchat, Yellowhammer, Reed Bunting, House Sparrow, Tree Sparrow, Starling, Magpie, Jackdaw, Rook and Carrion Crow.

Mammals and Amphibians (J. KNIGHT)

Over the three day meeting eight species of mammals and three species of amphibia were confirmed on the reserve.

Rabbits were common over much of the drier heathland with no signs of myxomatosis. One large hare was disturbed on the Saturday, quite close to a rabbit colony, yellowing of the grass showed that its form had been in use for some time. Moles were scarce over much of the area but several mole hills were found at the Riccall end of the reserve. One Bank Vole was seen also a Water Vole. The latter was seen swimming amongst the *Polygonum* in a drainage canal.

The mature pines had large stocks of Grey Squirrels; this was evident by the damaged pine cones beneath the trees. A dead squirrel, its tail cut off, was found near the Skipwith entrance. Presumably it had been shot.

Much evidence of foxes was noted throughout the reserve; a series of entrances had been filled in and probably gassed. A small (two month old?) cub was found dead nearby. It is possible that these holes had originally been made by badgers but recent signs of badger activity were not found.

Roe Deer were seen by several members and during the weekend 20 to 30 were reported near the village of Skipwith. Slots could be seen in the mud in several places, and saplings with bark damaged by Roe Deer were observed.

Several Common Frogs and one dead Toad were found and both mature and immature Crested and Common Newts seen, the latter found under stones.

Entomology (R. CROSSLEY)

Skipwith Common has long been a favourite hunting ground for Yorkshire entomologists and it was not expected that many new records for the area would be forthcoming from this meeting. The weather was not propitious for flying insects and most species recorded were taken either by sweeping or beating.

The Entomological Section visited Skipwith in May 1968 and September 1969 and lists of the insects found appeared subsequently in *The Naturalist*, (1969; 101 and 1970; 71). The following are additional to those published lists and the records are those of the writer and Messrs. H. Nicholson and A. H. Wright.

ODONATA:

Pyrrhosoma nymphula Sulzer A.H.W.

HEMIPTERA HETEROPTERA:

Scolopostethus decoratus (Hahn) R.C.

Anihocoris nemorum (L.) R.C.

Harpocera thoracica (Fall.) R.C. This is the earliest of the common oak bugs to appear in the spring and the present record is the first for V.C.61. The absence of records in the past is not likely to be due to a scarcity of the insect.

Dicyphus stachydis Reut. R.C.

Liocoris tripustulatus (Fab.) R.C.

HYMENOPTERA SYMPHYTA:

Trichiosoma tibialis (Hawthorn Sawfly) A.H.W.

DIPTERA:

Platychirus manicatus Mg. R.C.

P. peltatus Mg. R.C.

P. scutatus Mg. R.C.

Eristalis intricarius L. R.C.

LEPIDOPTERA:

Species noted by Mr. A. H. Wright.

Pieris rapae L. (Small White), *Euchloe cardamines* L. (Orange tip), *Lycaena phlaeas* L. (Small copper), *Aglais urticae* L. (Small tortoiseshell), *Saturnia pavonia* L. (Emperor moth), *Aethalura punctulata* Schiff (Grey birch), *Operophtera brumata* (L.) (Winter moth), *O. boreata* (Northern winter moth).

The following larvae have been identified by Mr. H. Nicholson; others taken by him will have to be bred out before being identified. *Eupsilia transversa* Hufn. (Satellite), *Geometra papilionaria* (Large emerald), *Allophyes oxyacanthae* (Green brindled crescent), *Episema caeruleocephala* L. (Figure of eight), *Euproctis similis* Fuessl (Yellow tail).

The insect list is not at all impressive and this reflects partly the lateness of the season generally, the poor collecting conditions and a low turn out by entomologists at this particular meeting.

Conchology (A. NORRIS)

Skipwith Common has always had a reputation amongst conchologists for being almost void of all forms of molluscan life; it was therefore of great interest to all the members of the Conchological Section present to be able to produce at the end of the meeting a list of 16 species found within the confines of the Common.

With the exception of *Pisidium personatum* Malm which we recorded from one of the flowing ditches, all the species were land forms, and confined to the areas bordering the footpaths, where the conditions are not quite so unfavourable.

The complete list of species found within the area of the Common is as follows:

Carychium minimum Müller

Cochlicopa lubrica (Müller)

Hygromia hispida (L.)

Discus rotundatus (Müller)

Arion intermedius Normand

A. circumscriptus Johnston

A. hortensis Ferussac

A. ater (L.)

Euconulus fulvus (Müller)

Vitrea contracta (Westerlund)

Oxychilus alliarius (Müller)

Retinella radiatula (Alder)

R. pura (Alder)

Agriolimax reticulatus (Müller)

A. laevis (Müller)

Pisidium personatum Malm

Vascular plants (E. CHICKEN)

The combination of an early meeting and a late spring resulted in a relatively short list of plants recorded from this acid bog and heathland area. The total number reported was 123. To obtain full cover, the Common was divided into squares and while this plan was not rigidly followed, the contrast between the eastern and central thirds was noticeable with 58 and 101 species respectively.

Of the dominant plants, the oaks attracted much attention being in full flower and also because of the galls upon them. *Viola palustris* (Bog Violet), *Pedicularis sylvatica* (Lousewort), *Myosotis discolor* (Yellow and blue Forget-me-not), *Drosera rotundifolia* (Sundew) and *Montia fontana* (Blinks) were seen but the species of most interest were *Acaena anserinifolia* and *Viola canina* (Dog Violet), both growing on an

old roadway and *Osmunda regalis* (Royal Fern) present as small plants on a central boggy area. Only five sedges were determined and we had no more success with the grasses due to the time of the year.

I am grateful to Mrs. J. M. Holloway who compiled the greater part of the list.

Bryology (M. DALBY)

Skipwith Common has been well worked bryologically ever since William Ingham's comprehensive reports at the turn of the century, so it is not surprising that no new records were made on this occasion. A number of old records were, however, confirmed and because so few habitats of this nature remain in the East Riding it was decided to give the list in full.

The most interesting find was *Tetraplodon mnioides* in full fruit growing on dung, presumably from the deer which are known to frequent the Common. This was previously recorded by Mr. A. Thompson in 1922, the specimen being in the possession of Mr. G. A. Shaw. Ten species of *Sphagna* were found, but not *S. riparium* also recorded by Mr. Thompson in 1929. There have been considerable changes on the Common since that date and it may be that its habitat has been destroyed.

A full list of the bryophytes found is as follows:-

<i>Sphagnum palustre</i>	<i>Bryum caespiticium</i>
<i>S. papillosum</i>	<i>B. argenteum</i>
<i>S. squarrosum</i>	<i>Mnium hornum</i>
<i>S. recurvum</i>	<i>M. undulatum</i>
<i>S. tenellum</i>	<i>M. punctatum</i>
<i>S. cuspidatum</i>	<i>Aulacomnium palustre</i>
<i>S. subsecundum</i>	<i>A. androgynum</i>
var. <i>inundatum</i>	<i>Amblystegium serpens</i>
var. <i>auriculatum</i>	<i>Drepanocladus fluitans</i>
<i>S. fimbriatum</i>	<i>D. uncinatus</i>
<i>S. capillaceum</i>	<i>Acrocladium stramineum</i>
<i>S. plumulosum</i>	<i>A. cuspidatum</i>
<i>Atrichum undulatum</i>	<i>Camptothecium sericeum</i>
<i>Polytrichum piliferum</i>	<i>Brachythecium albicans</i>
<i>P. aurantiacum</i>	<i>B. rutabulum</i>
<i>P. commune</i>	<i>B. rivulare</i>
<i>Ceratodon purpureus</i>	<i>Eurhynchium praelongum</i>
<i>Dicranella heteromalla</i>	<i>Pleurozium schreberi</i>
<i>Dicranum bonjeanii</i>	<i>Hypnum cupressiforme</i>
<i>D. scoparium</i>	var. <i>ericetorum</i>
<i>Campylopus piriformis</i>	<i>Rhytidiadelphus squarrosus</i>
<i>C. flexuosus</i>	
<i>Leucobryum glaucum</i>	HEPATICS
<i>Tortula muralis</i>	<i>Conocephalum conicum</i>
<i>Barbula convoluta</i>	<i>Marchantia polymorpha</i>
<i>B. recurvirostra</i>	<i>Riccardia pinguis</i>
<i>Weissia controversa</i>	<i>Pellia epiphylla</i>
<i>Grimmia pulvinata</i>	<i>Lepidozia reptans</i>
<i>Funaria hygrometrica</i>	<i>Calypogeia fissa</i>
<i>Tetraplodon mnioides</i>	<i>Gymnocolea inflata</i>
<i>Tetraphis pellucida</i>	<i>Mylia anomala</i>
<i>Orthodontium lineare</i>	<i>Lophocolea bidentata</i>
<i>Pohlia nutans</i>	<i>L. heterophylla</i>
<i>P. delicatula</i>	<i>Cephalozia bicuspidata</i>
<i>Bryum pendulum</i>	<i>C. connivens</i>
<i>B. pseudotriquetrum</i>	<i>Odontoschisma sphagni</i>
	<i>O. denudatum</i>

Nomenclature and sequence follows the Census Catalogues of Warburg, 1963 and Paton, 1965.

I am grateful to Miss Robertson, Dr. Shimwell, Mr. Shaw, Mr. Branson and Mr. E. Thompson for information and lists of species for this report.

THORNE MOOR, V.C. 63, - 6th and 7th June

The excursion to Thorne Moor this year was of particular interest, in that the Union was able to visit that part of the extensive bog which has been suggested by the Electricity Board as a possible site for the dumping of ash from nearby Drax power station. We gained access through a disused colliery leading off the Moorends road. Our leader on both days was Mr. W. Bunting, a local naturalist who has claimed for some years that this area has such a rich flora and fauna that it should be preserved as an area of Special Scientific Interest. The records below, which cannot be anything like complete lists if only because of the shortness of our visits, certainly substantiate the claim. This part of Thorne Moors is eminently in need of preservation as a Nature Reserve. It would be lamentable if its riches were despoiled in any way by industrial waste.

About twenty people were present on each day. After a picnic tea, prepared by Mr. and Mrs. F. E. Kemsley, the final meeting for reports was held in the open air and the Chair was taken by Mrs. J. Duncan. The warm thanks of the members were expressed to Mr. Bunting, who had shown the party many of the rare plants and had provided a guide map and most helpful preliminary notes; to Mr. Verhees, who had led the ornithologists (their expert local knowledge was invaluable in what appeared superficially to be rather dull and difficult terrain) and to Mrs. Kemsley, the Divisional Secretary, who had organised the weekend so successfully.

Fifteen affiliated societies were represented over the weekend.

Vascular Plants (F. MURGATROYD)

The botanists were favoured by the long spell of dry weather, as ground usually very wet was much more easily traversed, though from the plants' point of view conditions were less favourable, particularly for those species growing on the original peat levels such as *Calluna* (Ling), *Pteridium* (Bracken), and Birches, where there was obviously a high fire risk, the peat being tinder dry. Even the areas at a lower level from which some of the peat had been stripped at some time and now covered with a vegetation consisting of various bog plants, were dry, with the exception of some small hollows with a surface of drying, peaty mud.

The thickets of *Rhododendron ponticum* were conspicuous, being in full flower on the section of the moor first visited. This species is abundantly naturalised, a vast number of plants of all ages being noticed and along with the birches and willows forming quite dense woodland.

Pushing through this dense vegetation, some members of the party emerged on an open Cotton-grass covered area, the plants of that species being interspersed with *Erica tetralix* (Cross-leaved Heath), with numerous scattered plants of *Drosera rotundifolia* (Sundew) and occasional plants of *Andromeda polifolia* (Bog Rosemary) not in flower at this season. On approaching the edge of a path a good colony of *Drosera intermedia* (Sundew) was seen on the surface of a shallow depression on drying, peaty mud. Many seedlings of this species were present.

The party became united and followed a path along the side of one of the many canals, the water level of which was rather low. A good variety of marginal and aquatic plants were recorded, among which the following were some of the most interesting: *Phragmites communis* (Common Reed), *Calamagrostis canescens* (Purple Small Reed), *Phalaris arundinacea* (Reed Canary Grass), *Cladium mariscus* (Great Saw Sedge), *Carex elata* (Tufted Sedge), *C. curta* (White Sedge), *C. otrubae* (False Fox Sedge), *Scirpus lacustris* (Bulrush), *S. tabernaemontani* (Glaucous Bulrush), *Lysimachia vulgaris* (Yellow Loosestrife), *Lythrum salicaria* (Purple Loosestrife), *Andromeda polifolia* (Bog Rosemary), *Drosera rotundifolia* (Sundew) and *Utricularia vulgaris* (Bladderwort), very fine here and flowering abundantly. A small plant of *Osmunda regalis* (Royal Fern) was seen, though older, larger plants were seen in other places; *Dryopteris lanceolata-cristata* (Spiny Buckler Fern) and *D. dilatata* (Broad Buckler Fern) were also present. In a small, partly dry drain, *Hottonia palustris* (Water Violet) flowered in profusion. *Pinguicula vulgaris* (Butterwort) was reported.

A feature of the many canals was the fact that each had a different flora, no two being populated by exactly the same species. The next one visited contained *Myriophyllum alterniflorum* (Water Milfoil) and *Lysimachia nummularia* (Moneywort) in great abundance, the latter very much an aquatic plant in that particular situation, with some quantity of *Oenanthe fistulosa* (Water Dropwort) also. *Scirpus maritimus* (Sea Clubrush) was seen in yet another canal. On the tops of the banks bordering the

canals the vegetation was composed of species more typical of cultivated and grass land, though in places *Pteridium* (Bracken) was dominant, and one rather unexpected plant growing under it was *Ophioglossum vulgatum* (Adder's Tongue).

Only a small area of the moor was covered in the time available.

Bryology (M. DALBY)

Six main bryological habitats were noted:-

1. The canals, which are now silted up and recolonised.
2. Peat cuttings of varying depths and ages.
3. Banks of dry peat.
4. Peat mainly colonised by heather.
5. Tree stumps.
6. Footpaths and tracks.

1. *The Canals* Where these are colonised by *Phragmites* or reed mace there are very few bryophytes, but where they open out and some clear water appears, dense cushions of *Sphagna* occur along the banks and wherever an obstruction enables the plants to rise above the water. *Sphagnum fimbriatum* is the most frequent species in these habitats and luxuriant *S. squarrosum*, often partly submerged. Some *S. recurvum* occurs, with *S. subsecundum* var. *inundatum* and *S. cuspidatum*, the latter often submerged and very plumose. *S. palustre* grows in isolated tussocks at the edges and a small patch of *S. subsecundum* var. *subsecundum* was found. *Acrocladium cuspidatum* and *A. cordifolium* are local in the shallower areas with *Drepanocladus fluitans* and *D. exannulatus*. Large cushions of *Aulacomium palustre* are also present.

2. *Peat Cuttings* These vary in age and depth. The most frequent *Sphagna* appeared to be *S. recurvum* and *S. fimbriatum* with *Polytrichum commune* common in the shallower areas. These cuttings are most interesting as they show all stages in colonisation.

3. *Banks of dry peat* Most of the dry areas are sparsely covered with bryophytes, *Pohlia nutans* being the main colonist, with *Polytrichum juniperinum*, *P. piliferum*, *Dicranella heteromalla*, *D. cerviculata*, *Ceratodon purpureus* and local areas of *Campylopus pyriformis*. In damper places the hepatics *Calypogeia muellerana* and *C. fissa* were noted.

4. *Peat mainly colonised by heather.* Here *Sphagnum plumulosum* is frequent, *S. papillosum* grows in dense tussocks and *S. capillaceum* and *S. robustum* are occasional.

5. *Tree stumps* True epiphytes appear to be rare, perhaps because most of the living trees are comparatively young. Bryophytes occur on the dead stumps and include *Tetraphis pellucida*, *Cephalozia bicuspidata*, *Lophocolea cuspidata*, *L. heterophylla*, *Lepidozia reptans*, *Aulacomium androgynum*, *Brachythecium rutabulum*, *Amblystegium serpens* and very rarely, *Orthodontium lineare*. At the base of the willows *Leptodictyum riparium* was found.

6. *Footpaths and tracks* Mingled with grass at the side of the tracks are such species as *Lophocolea bidentata*, *Rhytidiadelphus squarrosus*, *Pseudoscleropodium purum* and *Eurhynchium praelongum*. On soil was found *Fissidens taxifolius*, *Eurhynchium swartzii* and *Barbula convoluta*.

Although the number of species found is not numerous, the area is of great interest because the different ages and depths of the peat cuttings cause the habitat to change continually and illustrate all the stages of succession in recolonisation. The exceptional luxuriousness and abundance of many species, especially the *Sphagna*, is particularly noteworthy. One interesting exception is the almost complete absence in this part of the Waste of *Orthodontium lineare*, a moss which in many parts of Yorkshire is an active colonist of bare peat and the bases of trees. A full list of species follows:-

Sphagnum palustre
S. papillosum
S. squarrosum
S. recurvum
S. cuspidatum
S. robustum
S. capillaceum

Sphagnum plumulosum
S. subsecundum
 var *subsecundum*
 var *inundatum*
 var *auriculatum*
S. fimbriatum
Atrichum undulatum

<i>Polytrichum piliferum</i>	<i>Bryum capillare</i>
<i>P. juniperinum</i>	<i>Mnium hornum</i>
<i>P. commune</i>	<i>M. undulatum</i>
<i>Fissidens taxifolius</i>	<i>M. punctatum</i>
<i>Ceratodon purpureus</i>	<i>Aulacomnium palustre</i>
<i>Dicranella heteromalla</i>	<i>A. androgynum</i>
<i>D. cerviculata</i>	<i>Amblystegium serpens</i>
<i>Dicranum scoparium</i>	<i>Leptodictyum riparium</i>
<i>Campylopus pyriformis</i>	<i>Drepanocladus fluitans</i>
<i>C. flexuosus</i>	<i>D. exannulatus</i>
<i>Tortula muralis</i>	<i>Acrocladium cordifolium</i>
<i>Barbula convoluta</i>	<i>A. cuspidatum</i>
<i>B. unguiculata</i>	<i>Brachythecium rutabulum</i>
<i>Weissia controversa</i>	<i>B. rivulare</i>
<i>Tetraphis pellucida</i>	<i>Eurhynchium praelongum</i>
<i>Orthodontium lineare</i>	<i>E. swartzii</i>
<i>Pohlia nutans</i>	<i>Pseudoscleropodium purum</i>
<i>Bryum caespitium</i>	<i>Hypnum cupressiforme</i>
<i>B. argenteum</i>	var <i>ericetorum</i>
<i>B. bicolor</i>	<i>Rhytidadelphus squarrosus</i>

HEPATICAS

<i>Marchantia polymorpha</i>	<i>Lophocolea bidentata</i>
<i>Riccardia pinguis</i>	<i>L. cuspidata</i>
<i>Pellia epiphylla</i>	<i>L. heterophylla</i>
<i>Lepidozia reptans</i>	<i>Cephalozia bicuspidata</i>
<i>Calypogeia muellerana</i>	<i>C. connivens</i>
<i>C. fissa</i>	

Nomenclature follows the Census Catalogues of Warburg, 1963 and Paton, 1965. I am grateful to Miss Hartley and Mr. Branson for assistance with this report.

Ornithology (R. F. DICKENS)

Forty-five species of birds were recorded on the Saturday. It was somewhat surprising to see Tawny Owl in an area with few mature trees and equally so to see Little Ringed Plover at a peaty pool in the centre of the moors. They were in a more usual habitat on the colliery heaps at the edge of the moors. Yellow Wagtails and Redstart were feeding young on the more open part, at the edge of the peat workings. Sedge Warblers were unaccountably silent and no Grasshopper Warbler was heard during the day, although both species are well known in the area. By contrast, Blackcap song was very much in evidence, especially in the Rhododendron thickets, and Redpolls were constantly seen and heard. Obviously, the large colony of Black-headed Gulls receives too much attention from local youths.

The most interesting observation of the day was a pair of Willow Warblers giving persistent alarm calls which attracted our attention to a young, unfledged bird out of the nest, wriggling about on the ground. As we went nearer, a good-sized adder sidled away, obviously disturbed from its meal.

Additional species seen on the Sunday included Lesser Whitethroat and Grasshopper Warbler. The list for Saturday also included the following:

Willow Warbler, Wren, Skylark, Whitethroat, Song Thrush, Mistle Thrush, Garden Warbler, Linnet, Great Black-backed Gull, Blackcap, Yellow Bunting, Sedge Warbler, Black-headed Gull, Blackbird, Redpoll, Swift, Swallow, Cuckoo, Turtle Dove, Nightingale, Woodcock, Snipe, Reed Bunting, Little Ringed Plover, Whinchat, Bullfinch, Robin, Lapwing, Tawny Owl, Chiffchaff, Tree Pipit, Pied Wagtail, Green Woodpecker, Moorhen, Greenfinch, Yellow Wagtail, Redstart, Teal, Mallard, Wood Pigeon, Tree Sparrow, House Sparrow, Starling, Hedge Sparrow, Reed Warbler.

R. Mitchell sent in the following report of the Sunday's activities:

On a warm and sunny day, a route was selected from the Thorne Colliery entrance to the Gull ponds beyond the centre of the Moor, which encompassed a good variety of habitats. Amongst the woodland, on the Moor edge, several good observations were made: of the warblers, four singing Blackcaps, two pairs of Lesser Whitethroats and six singing Grasshopper Warblers were noted, whilst a singing Nightingale was a different one from that recorded on the Saturday. The wetter areas further into the Moor produced several Reed Warblers and Sedge Warblers, the latter species appearing

to have recovered fairly well in the area after the very low numbers in 1969. Two Green Woodpeckers and a Great Tit (an uncommon species for this district), were of interest, whilst four pairs of Willow Tits, located well into the Moor, seemed to have overcome the difficulty of finding nesting sites.

At the larger flooded areas of peat workings known as the Gull Ponds, four family parties of Teal, a female Garganey, a single Water Rail and Little Grebe were recorded, together with a Little Ringed Plover, which was probably one of a pair which has bred successfully on Thorne Colliery tip. Inevitably, hundreds of Black-headed Gulls filled the air, screaming and wheeling.

Adjoining the Gull Ponds and extending to the northern edge of the Moor, is a large open area of peat workings. Here, Pied and Yellow Wagtails were obviously having a very good breeding season and perhaps the most interesting bird of the day, a *flava* wagtail was present, which had the characteristics of the Blue-headed race. The final check list total for a most enjoyable day was 58 species.

Other Vertebrates

Adders and Common Lizard were both seen during the visit.

Weasel and Stoat were both seen by members.

Entomology (P. SKIDMORE)

Included in this report are all of the species recorded on the trip, including the commonest ones. The entomologists present were Messrs. R. Crossley, J. H. Flint, J. D. Flint, C. A. Howes, P. Skidmore, A. H. Wright and J. Burn.

PSOCOPTERA

Caecilius flavidus (Stephens), common on birches.

MEGALOPTERA

Sialis lutaria L. common along canals.

A Snake fly (*Rhaphidia* sp.) larva was found beneath elm bark by site of Elmhirst cottage.

NEUROPTERA

Chrysopa perla (L.), common on birches.

ODONATA

Pyrrosoma nymphula (Sulzer), abundant along canals.

Enallagma cyathigerum Charp., common along canals.

Libellula 4-maculata L. Common over *Eriophorum* bogs.

An *Aeshna* nymph, apparently *A. grandis* (L.) found in one canal.

ORTHOPTERA

Tetrix vittata (Zett.), Several on dry heathy parts.

TRICHOPTERA

Neuronia ruficus (Scop.) Pair in cop. on *Juncus effusus* near Gull colony.

Limnephilus vittatus (F.) and *L. sparsus* Curtis.

LEPIDOPTERA

Cynia mendica (Clerck) One male amongst *Salix* carr.

Dasychira pudibunda (L.) Pair in cop by Gull colony.

Euproctis similis (Fuessly) Larvae abundant.

Arctia caja L. One larva on *Urtica*.

Phragmatobia fuliginosa (L.) Empty cocoons on *Calluna*.

Philudoria potatoria (L.) Larvae frequent.

Pararge megera (L.) Common.

Euchloe cardamines (L.) Abundant on moor edges by colliery.

All three *Pieris* species recorded.

Nymphalis io (L.) Several adults about *Urtica* etc.

Aglais urticae (L.) Several colonies of larvae.

Lycæna phlaeas (L.) Common on moor edges and tracks.

Polyommatus icarus (v. Rott.) Common along moor tracks.

Euclidimera mi (L.) One adult on old track on moor; J.B.

Arenostola phragmitidis (Hb.) One caterpillar swept from *Phragmites*.

Cabera pusaria (L.) Common on birches.

Lithina chlorosata (Scop.) Abundant amongst bracken.

Bactra lancealana (Hb.) Abundant amongst *Juncus effusus*.

Tinea semifulvella Haw. One on fungoid birch.

HEMIPTERA

- Tingis ampliata* (H.-S.) Abundant on thistles on moor edge.
Nabis ericetorum Scholtz. Common on *Calluna*.
Kleidocerys ericae Horv. Abundant on *Calluna*.
Scolopostethus decoratus (Hahn) Common on *Calluna*.
Liocoris tripustulatus (F.) Common on nettles.
Monalocoris filicis (L.) Common on bracken.
Gerris lacustris (L.) Common on canals.
Nepa cinerea L. Common in canals.
Cercopis vulnerata Germ. Common on moor edges.
Ulopa reticulata (F.) Frequent on *Calluna*.
Stiroma pteridis (Bch.) Abundant on bracken.

COLEOPTERA

- Cicindela campestris* L. Common on dry paths on moor.
Carabus granulatus L. One in rotten birch.
Pterostichus nigrita (F.) Common amongst *Juncus* refuse.
Agonum gracile (Gyll.) Common amongst *Sphagnum*.
A. viduum (Pz.) One by dike on moor edge.
Bembidion harpaloides Serv. One under *Salix fragilis* bark.
Dromius atricapillus (L.) Common by sweeping on moor edge.
Agabus bipustulatus (L.) Abundant in dikes.
Laccophilus variegatus (Germ.) One taken on moor edge by J.D.F.
Acilius canaliculatus (Nic.) Several with preceding species.
Anisotoma humeralis (F.) Common in *Reticularia*.
Corymbites incanus (Gyll.) Common on birches etc.
Hypnoides riparius (F.) In plant refuse on moor edge.
Denticollis linearis (L.) Common on birches etc.
Elater balteatus L. Abundant on birches etc.
Melanotus rufipes (Hbst.) Common in dead trees.
Agriotes pallidulus (Ill.) Abundant on birches etc.
A. obscurus (L.) One under stone on moor edge.
Dalopius marginatus (L.) Common on birches etc.
Athous haemorrhoidalis (F.) Abundant by sweeping.
Rhagonycha lignosa (Ml.) Abundant on birches etc.
R. limbata Thom. Abundant on trees.
Cantharis cryptica Ashe., *C. nigricans* (Mueller), *C. rustica* L., and *C. livida* L. were all frequent by general sweeping.
Podabrus alpinus (Pk.) Sparingly by sweeping moor edges.
Coccinella hieroglyphica L. Common on *Calluna*.
Adalia bipunctata (L.) Generally numerous.
Thea 22-bipunctata (L.) Mainly on moor edges.
Propylea 14-guttata (L.) Common on birches etc.
Chilocorus renipustulatus (Scriba.) On sawlow trunks.
Enicmus testaceus (Steph.) Several in *Reticularia*.
Anaspis maculatus Geoff. Abundant on flowers.
Malachius bipustulatus (L.) Common by sweeping.
Rhinosimus planirostris (F.) One under elm bark.
Pyrochroa serraticornis (L.) Several on moor edge near site of Elmhirst Cottage.
Clytus arietis (L.) Adults common, especially on moor edges, on flowers and foliage.
Tetrops praeusta (L.) One beaten from old apple tree, on moor edge by colliery stacks, P.S.
Donacia clavipes F. One floating on water in *Juncus effusus* bog near Gull colony, P.S. This is normally associated with *Phragmites*.
Phyllodecta vitellinae (L.) Numerous on aspens.
Cassida rubiginosa Ml. On Compositae commonly.
Polydrosus cervinus (L.) Abundant on birches.
Phyllobius pyri (L.), *P. urticae* (De Geer) and *P. oblongus* (L.), were common by general sweeping.
Balanobius salicivorus Pk. On Sallows, frequent.

HYMENOPTERA

Strongylogaster lineata (Chr.) Common on bracken.
Tenthredo livida L. Common amongst nettles etc.
Tenthredopsis nassata (L.) Common generally.
Aglaostigma fulvipes (Scop.) Frequent on moor edges.
Calameuta pallipes (Klug.) Common on moor edges.
Hartigia linearis (Schränk) Sparingly on moor edges.
Cephus cultratus v. Eversm. Several on moor edges.
Selandria serva (F.) Common along canals.
Vespa rufa L. Several queens seen on dead trees.

DIPTERA

Prionocera turcica (F.) Common along canals.
Rhagio scolopacea (L.) Generally common.
Microchrysa polita (L.) Several on moor edge.
Tabanus bimaculatus Mg. Several specimens of the type form on moor edge; a fortnight later this species could not be found but *T. montanus* Mg. had appeared!
Empis stercorea L. Generally common.
E. trigramma Mg. with preceding.
Dioctria atricapilla Mg. Several on moor edge by Colliery stack.
D. rufipes De Geer With preceding.
Haematopota crassicornis Wahlb. Females biting.
Chilosia variabilis (Pz.) Generally common.
Sericomyia lappona (L.) Common generally.
Helophilus hybridus Lw. Common along dikes.
H. versicolor (F.) Common along dike on moor edge.
H. lineatus (F.) Common with preceding.
Eristalis pertinax Scop., *E. intricaria* (L.), and *E. sepulchralis* (L.) generally common.
Myiatripa florea (L.) Common on Rhododendrons.
Volucella pellucens L. Frequent on Rhododendrons etc.
V. bombylans L. With preceding.
Xylota segnis (L.) Frequent on Rhododendrons.
Syrirta pipiens (L.) Common on moor edge.
Tropidia scita (Harris) Remarkably abundant even on the moor though more so on edges.
Eumerus strigatus (Fallen) Common on moor edge.
Platychirus peltatus (Mg.) Common on moor edge.
Syrphus elegans (Harr.) Frequent about birches etc.
S. tricinctus Fallen Frequent on moor.
Sphaerophoria menthastri (L.) Common on moor edges.
Leucozona lucorum (L.) Common generally.
Rhacocoehaena toxoneura (Lw.) A little known species of which one specimen was taken in willow carr by main canal; P.S. Only other known Yorkshire locality is Denaby Ings (see Y.N.U. Annual Report for 1969; *Naturalist*, 1970)
Psila fimetarius (L.) Frequent on moor edges.
P. obscuritarsis Lw. Sparingly on moor edges.
Sciomyza dubia Fallen Pair in wood by moor edge.
Tetanocera elata F., *T. laevifrons* Lw. and *T. robusta* Lw. taken along canals.
Cnempogon apicalis (Wd.) Frequent amongst *Phragmites*.
Cordilura pudica Mg. Frequent amongst *Eriophorum*.
Scatophaga stercoraria (L.) and *S. lutaria* (F.) generally abundant on foliage.
Philophylla heraclei (L.) Frequent on moor edge.
Allophyla atricornis (Mg.) One amongst Rhododendrons.
Lipara lucens (Mg.) Several adults swept from *Phragmites* upon which galls abundant.
Servillia ursina (Mg.) One in Rhododendron thicket; R.C.
Morinia nana (Mg.) Several on moor edge.
Degeeria collaris (Fallen) Abundant on birches.
Polieta lardaria (F.) Common on moor edges.
Hydrotaea dentipes (F.) Abundant on foliage.
Trichopticoidea decolor (Fallen) Females attracted to perspiration with *Morella simplex* but in much smaller numbers than that species.
Hebecnema affinis Malloch Abundant on foliage.

Mydaea urbana (F.) Abundant on foliage.
Graphomyia maculata (Poda) Common on umbels etc.
Phaonia gobertii Mik. Common on birch trunks.
P. incana (Wd.) Abundant on *Ranunculus* flowers etc.
P. serva (Mg.) Common on flowers.

Many additional species await determination and it is expected that some of these may appear in the Annual Report for 1970. Further visits were made by the writer on the occasion of the Leicestershire Naturalists' Society meeting in June; and the Lincolnshire Naturalists' Union on July 4th. Between these dates a disastrous fire swept over much of the area, but it did not particularly adversely affect the essential members of the flora and fauna; – the best bog plant communities, and insects like the Large Heath butterfly (*Coenonympha tullia* Ml.). One of the most interesting flies found on Thorne Moor (*Pogonota hircus* Zett.) was in great abundance after the fire!

Arachnida (C. A. HOWES)

Listed below are all of the species taken on the Y.N.U. meeting; collectors were Messrs. J. D. Flint, Bernard Lawrence, Peter Skidmore and the writer (C.A.H.). The most interesting find was *Araneus scolopetarius* (Clerck) taken by B. Lawrence for this was a new county record.

Dictyna arundinacea (L.) Females common in dead *Juncus effusus*, *Rubus*, *Hieracium* and *Crepis* inflorescences; C.A.H.
Xisticus auxax (Schrank) Male on bare peat ridge; C.A.H.
Tibellus maritimus (Menge) Female in *Phragmites* leaf; P.S.
Salticus scenicus (Clerck) Both sexes on brickwork of old bridge; C.A.H.
S. cingulatus (Panzer) Both sexes common on rotten birch stumps; C.A.H.
Lycosa nonticola (Clerck) Both sexes on dry *Calluna* areas; C.A.H.
L. tarsilis (Thorell) Both sexes on dry peat; C.A.H.
L. pullata (Clerck) Females on dry peat; C.A.H.
L. amenata (Clerck) Females on edges of main paths; C.A.H.
L. nigriceps (Thorell) Female in *Phragmites* by Colliery stack; C.A.H.
L. lugubris (Walckenaer) Female in birchwood on moor; C.A.H.
Trochosa terricola (Thorell) Female on dry peat; C.A.H.
Pirata piraticus (Clerck) Both sexes common on open water and *Sphagnum*; C.A.H.
P. hygrophilus (Thorell) Both sexes on *Sphagnum*; C.A.H.
Argyroneta aquatica (Clerck) In dike on moor edge; J.D.F.
Agelena labyrinthica (Clerck) Under masonry on Colliery stack; C.A.H.
Tegenaria domestica (Clerck) Female under debris on Colliery stack; C.A.H.
Theridion ovatum (Clerck) Female on Rhododendrons; C.A.H.
T. pallens Blackwall Females common on Rhododendrons; C.A.H.
Tetragnatha extensa (Linnaeus) Both sexes amongst shaded grass; C.A.H.
T. montana Simon Females in shaded grass along main paths; C.A.H.
Meta segmentata mendei (Blackwall) On Rhododendrons; C.A.H.
M. merianae (Scopoli) Both sexes under low bridge; C.A.H.
Araneus diadematus (Clerck) Immature female on bracken; C.A.H.
A. scolopetarius (Clerck) One male taken by B. Lawrence; First record for Yorkshire.
A. umbraticus (Clerck) Several of both sexes under loose bark of rotten birch; C.A.H.
 Many newly hatched cocoons of an undetermined *Araneus* species amongst *Calluna*; C.A.H.
Linyphia triangularis (Clerck) Females in shaded grass by path edges; C.A.H.
L. montana (Clerck) Females amongst Rhododendrons; C.A.H.

Conchology (A. NORRIS)

Thorne Waste is for the conchologist a very barren area, as due to the very acid conditions terrain like this can support only a very few molluscs, none of which could be traced during this field meeting. The conchological report is therefore a negative one as far as the Waste itself is concerned. The only places in which molluscs could be found were the ditches surrounding the Waste, particularly in the area of Moorends where a limited supply of freshwater species can be found.

HUTTON RUDBY, V.C. 62 – 21st June

The Union's excursion to Hutton Rudby was divided between the woods and farmland on the banks of the river Leven below the village, which we visited in the morning, and the steep-sided valley of the same river, nearer Sexhow, in the afternoon, where mature, relatively undisturbed deciduous woodland predominates. Mr. Wilson, of Hutton Rudby, kindly acted as our local guide in the afternoon and showed us numerous sites as well as established badger setts there.

Twenty-five members representing ten affiliated societies were present and they were able to explore the district in glorious sunshine.

Tea, held at the 'Snaffle Bit Hotel' at nearby Stokesley, was followed by the customary meeting for reports, when the Chair was taken by Mrs. Ellen Hazelwood. Mr. Ian Lawrence was thanked for all his work in organising and leading the day's activities and thanks were also expressed to the various landowners who had so kindly granted us access to their property.

Vascular Plants (A. and M. MULLIN)

Two hundred and thirty one species were recorded in the area during the day; fifty one were additions to the 10 km. square, and these last are listed below. The most interesting were the large stand of *Scirpus sylvaticus*, *Carex dioica*, *Potamogeton crispus* (Curled Pondweed), *Pulicaria dysenterica* (Fleabane), *Stellaria neglecta* (Greater Chickweed) and *Orchis fuchsii* and *O. maculata* (Spotted Orchids).

Additions to the Hutton Rudby 10 km. square (N.Z. 40.) were:

Equisetum telmateia, *Ranunculus ficaria*, *Barbarea vulgaris*, *Hypericum hirsutum*, *Polygala vulgaris*, *Rubus idaeus*, *Ribes uva-crispa*, *Epilobium parviflorum*, *Polygonum amphibium*, *Primula vulgaris*, *Salix viminalis*, *Myosotis palustris*, *Scrophularia nodosa*, *Veronica filiformis*, *V. arvensis*, *V. montana*, *Plantago media*, *Campanula latifolia*, *Valeriana dioica*, *Pulicaria dysenterica*, *Eupatorium cannabinum*, *Tanacetum vulgare*, *Carduus acanthoides*, *Leontodon hispidus*, *Crepis paludosa*, *Triglochin palustre*, *Potamogeton crispus*, *Dactylorhiza fuchsii*, *D. maculata*, *Luzula campestris*, *Scirpus sylvaticus*, *Carex hostiana*, *C. disticha*, *Festuca arundinacea*, *F. ovina*, *Alopecurus geniculatus*, *Sanicula europaea*, *Stellaria neglecta*, *Adoxa moschatellina*, *Alchemilla vestita*, *Symphoricarpos rivularis*, *Symphytum x uplandicum*, *Anemone nemorosa*, *Bryonia dioica*, *Endymion nonscriptus*, *Geranium dissectum*, *Glyceria plicata*, *Typha latifolia*, *Veronica hederifolia*, *Mentha spicata*, *Impatiens glandulifera*.

Bryology (M. DALBY)

Miss Robertson reports that conditions were extremely dry, but some collecting was done in damp places near the river Leven and in one or two small, calcareous bogs draining into the Leven. Her list is as follows:-

<i>Dicranella varia</i>	<i>Cratoneuron filicinum</i>
<i>Dicranoweissia cirrata</i>	<i>C. commutatum</i>
<i>Tortula muralis</i>	<i>Amblystegium serpens</i>
<i>Barbula fallax</i>	<i>Leptodictyum riparium</i>
<i>Fontinalis antipyretica</i>	<i>Acrocladium cuspidatum</i>
<i>Mnium hornum</i>	<i>Brachythecium rutabulum</i>
<i>M. cuspidatum</i>	<i>B. rivulare</i>
<i>M. undulatum</i>	<i>Eurhynchium praelongum</i>
<i>Thamnum alopecurum</i>	<i>Pseudoscleropodium purum</i>
<i>Thuidium tamariscinum</i>	<i>Rhytidiadelphus squarrosus</i>

HEPATIC

<i>Conocephalum conicum</i>	<i>Pellia epiphylla</i>
<i>Lunularia cruciata</i>	<i>Lophocolea bidentata</i>
<i>Marchantia polymorpha</i>	<i>L. heterophylla</i>
<i>Riccardia pinguis</i>	<i>Plagiochila asplenoides</i> var <i>major</i>

Ornithology (J. E. KNIGHT)

Although the overall list of species seen is not impressive, it should be realised that much of the day was spent in thick woodland which made observations difficult.

A total of 48 species were recorded, with many of them heard in song. Perhaps the highlight of the day was a Kingfisher which was seen by many of the members.

Other species were:- Mallard – two ducks with seven young and one with eight, Canada Goose, Kestrel, Red Grouse (not in its usual habitat), Pheasant, Moorhen, at least two nests containing eggs, Snipe, Wood pigeon, Tawny owl, Skylark, Swallow, two nests each containing eggs within 18 inches of each other in an outbuilding. House Martins, Sand Martins, Carrion Crow, a fledged young bird unable to fly was found in a field. Rook, Jackdaw, Magpie feeding fledged young, Jay, Great Tit, Blue Tit, Marsh Tit, Tree Creeper feeding young in a nest directly opposite the lunch area. Wren, Mistle thrush, Song thrush, Blackbird – incubating in the same outbuilding where the swallows were nesting; Robin, Grasshopper Warbler, Blackcap, Garden Warbler, Whitethroat, Lesser Whitethroat, Willow warbler, Chiffchaff, Spotted Flycatcher, Dunnock, Meadow Pipit, Tree Pipit, Pied Wagtail, Starling, Greenfinch, Linnet, Redpoll, Chaffinch, Yellowhammer, Cornbunting, House Sparrow and Tree Sparrow.

Whitethroats were not plentiful but probably in higher numbers than last year. Chiffchaffs were plentiful throughout the area, as were Blackcaps.

Surprisingly there were no Redstarts and only one Spotted Flycatcher.

Mammals

Fox, Rabbit, Grey Squirrel, Mole and Badger were all recorded. Badgers were very well established in deciduous woodland on the steep banks of the Leven.

Entomology – Lepidoptera

The following species were reported by various members at the meeting: Orange tip, Little Skipper, Small Copper, Brimstone, Red Admiral, Large White, Small White, and Green Veined White, and the Yellow Underwing moth.

Conchology (A. NORRIS)

With three members of the Conchological Section present and a good rich collecting area to examine we expected to find a large number of land and freshwater mollusca. Forty-two species were recorded bringing the numbers for that 10 km. square to a total of 53 species.

No new vice-county records came to light, but a number of very interesting extensions to the known range of some of the more local species made the area of special interest to us. One of the more interesting records was the occurrence of *Vertigo substriata* (Jeff.) in a marsh near Sexhow Farm. This species, due to its small size, has been overlooked in many of the more remote areas of Yorkshire and its distribution is not too well known. The Duck Mussel, (*Anodonta anatina* (L.)), recorded from the River Leven just below Hutton Rudby was also a very interesting addition to its known distribution in Yorkshire. The full list of species recorded is as follows:-

<i>Potamopyrgus jenkinsi</i> (A. E. Smith)	<i>Arion fasciatus</i> (Nilsson)
<i>Carychium minimum</i> Müll.	<i>A. ater</i> (L.)
<i>C. tridentatum</i> (Risso)	<i>Euconulus fulvus</i> (Müll.)
<i>Lymnaea truncatula</i> (Müll.)	<i>Vitrea crystallina</i> (Müll.)
<i>L. peregra</i> (Müll.)	<i>Oxychilus cellarius</i> (Müll.)
<i>Ancylus fluviatilis</i> Müll.	<i>O. alliarius</i> (Miller)
<i>Succinea pfeifferi</i> Rossm.	<i>Retinella radiatula</i> (Alder)
<i>Cochlicopa lubrica</i> (Müll.)	<i>R. pura</i> (Alder)
<i>C. lubricella</i> (Stab.)	<i>R. nitidula</i> (Drap.)
<i>Columella edentula</i> (Drap.)	<i>Zonitoides nitidus</i> (Müller)
<i>Vertigo substriata</i> (Jeff.)	<i>Vitrina pellucida</i> (Müll.)
<i>Lauria cylindracea</i> (da Costa)	<i>Lehmannia marginata</i> (Müller)
<i>Vallonia excentrica</i> Sterki	<i>Agriolimax reticulatus</i> Müll.
<i>Marpessa laminata</i> (Mont.)	<i>A. laevis</i> (Müll.)
<i>Clausilia bidentata</i> (Strom)	<i>Anodonta anatina</i> (L.)
<i>Arianta arbustorum</i> (L.)	<i>Sphaerium corneum</i> (L.)
<i>Hygromia striolata</i> (C.Pfe.)	<i>Pisidium casertanum</i> (Müll.)
<i>H. hispida</i> (L.)	<i>P. personatum</i> Malm
<i>Monacha granulata</i> (Alder)	<i>P. subtruncatum</i> Malm
<i>Arion intermedius</i> Normand	<i>P. nitidum</i> Jenyns
<i>A. circumscriptus</i> Johnston	

Landforms (C. SIMMS)

Although Hutton Rudby is situated in the Tees plain, it is a district of some (if rather confused) character of relief. A great thickness and mixture of glacial deposits overlie soft Triassic marls probably preglacially eroded by the sea. The irregular surface

of sands, gravels and clays with boulders retains some wet hollows, but is arable on the lighter soils and where there has been drainage. The result is a landscape of varied land-use and wildlife potential.

In postglacial times the small but vigorous River Leven, tributary to the Tees, has cut back rapidly through the district to drain Kildale and the Ingleby embayment in the Cleveland scarplands. So its deep-cut sinuous course in the area visited is still narrow and rather steep-sided, and its many tributary becks tend to be short although recently much lengthened by running the Cleveland plain drains and 'stells' into them during drainage improvements. The stream-sides offer a lot of scope to naturalists, for example the slopes in the lighter soils are picked out by badger-sett distribution.

Between Enterpen and Sexhow the Potto beck joins the Leven from the south, and downstream of the junction there has been a history of flooding in the Leven valley and there are still relics of wet woodland at old Potto Carr and Old Hutton Wood. To the north of Hutton Rudby village there are small discrete drainage basins, once together making up the considerable swamp of Seamer Moor, underlain by brickearth. Seamer Moor was still important botanical territory during the nineteenth century, with collecting by James Dalton amongst others. Other ill-drained hollows, as at Broad Carr and the once extensive Potto Carr, are now predominantly farmland of variable quality. The history of the drainage of the district still leaves much to be decided, but the carrs and the Leven probably still relate to the wasting of the ice northward away from the scarp. Farmhouse styles and field names further suggest the late agricultural development of the district, which nevertheless seems to have been little worked by naturalists recently.

BIRKIN, NEAR SHERBURN IN ELMET, V.C. 64, 4th July

The day's activities were divided between the lake and woodland of Byram Park, about a mile from Birkin itself, and the area in and around the Old Eye, near Birkin Church, which is meadowland bordering a small stream.

Twenty members were present, representing twelve affiliated societies. Tea was taken at the Red Bear Hotel, Sherburn in Elmet. At the meeting for reports afterwards, Mr. George Shaw produced an Excursion Circular for the Union's previous meeting there in 1884, at the same hotel, when over a hundred members had been present. Its price quotations and arrangements for transport made a very interesting comparison with present day conditions. The Chair was taken by Mr. R. F. Dickens. The Divisional Secretary, Miss H. Lefèvre, was thanked for making all the arrangements for the day and a vote of thanks was also expressed to the landowners who had allowed us to visit their properties.

After tea, some members visited the nearby Sherburn Willows, a dry magnesian limestone slope, with a stream and marsh at the bottom, which has a particularly well developed, typical flora for such a site, so far undisturbed by farming activities.

Bryophytes (F. E. BRANSON)

This area appeared almost devoid of bryophytes, although rich in flowering plants. Never have I seen such a dearth of mosses and not a single hepatic was seen in the area. The complete list of species was just a dozen. The scarcity of these plants could not have been attributed to the dryness of the season, although doubtless, had the conditions been more moist, it would have probably been easier to add to the list. The best find was *Gyroweissia tenuis* (Hedw.) Schimp., a very small species scraped off a large stone, to which it was adhering very closely. I had *Encalypta streptocarpa* from limestone pasture in Sherburn Willows. On the dried mud banks of the 'Old Eye' there was some *Physcomitrium pyriforme*. The remaining nine species were: *Barbula tophacea* in a field, fruiting *Ceratodon purpureus* var. *purpureus*, *Tortula muralis*, *Fissidens bryoides*, *Fontinalis antipyretica* in Byram Park Lake, *Brachythecium rutabulum*, *Amblystegium serpens*, *Leptodictyum riparium* and *Eurhynchium praelongum*.

Most of these were in a very depauperate state and some so dry that they almost crumbled at a touch.

Ornithology (J. E. KNIGHT)

A total of 56 species was recorded during the day, the morning of which was spent in Byram Park, which consists of somewhat overgrown woodland and ornamental ponds. The parkland produced large numbers of Collared Turtle Doves which could be heard throughout the visit, but there were surprisingly few waterfowl. The afternoon

spent in the open area, bordering the 'Old Eye', was made memorable by the delightful family parties of Goldfinches seen on the thistles, and probably anticipating their seeding.

Birds recorded during the day were:- Little Grebe (a nest most likely containing eggs was found), Canada Geese, Mute Swan, Red-legged Partridge, Pheasant, Moorhen (nest with eggs found), Coot (several with young and a nest with five eggs), Lapwing (these had formed fairly large flocks), Snipe, Redshank, Black-backed Gull, Black-headed Gull, Wood Pigeon (seen on a nest), Collared Turtle Dove (also with nests), Little Owl (found dead), Swift, Skylark, Swallow, House Martin, Sand Martin, Carrion Crow, Rook, Jackdaw, Great Tit (with fledged young), Blue Tit, Coal Tit, Willow Tit, Wren, Songthrush, Blackbird, Redstart, Robin, Sedge Warbler, Blackcap, Whitethroat, Willow Warbler, Chiffchaff, Spotted Flycatcher, Dunnock, Meadow Pipit, Pied Wagtail, Yellow Wagtail, Starling, Greenfinch, Goldfinch, Linnet, Redpoll, Bullfinch, Chaffinch, Yellowhammer, Corn Bunting, Reed Bunting, House Sparrow and Tree Sparrow.

Other Vertebrates:

Fox, Rabbit, Water Vole and Moles were seen during the day.

Adult frogs and toads were seen and at the lake-side at Byram Park huge numbers of young toads were moving about in the grass. They were obviously this year's young.

Conchology (A. NORRIS)

Five members of the conchological section were present and a total of 39 species were recorded, but only three of these were new records for the area. The total number of species recorded for the 10 kilometer square 44/5-2-, now stands at 61.

A report of the mollusca recorded from the Old Eye at Birkin was published in the annual report for 1968 (*Nat.* 1969; 9-10).

The three species new to the area are as follows:- *Arianta arbustorum* (L.), *Hygromia striolata* (C. Pfeiffer), *Pisidium nilium* Held.

Vascular Plants (F. MURGATROYD)

The Byram Park party spent most of the time investigating the area surrounding the lake, where the scarcity of flowering plants was commented upon, the exception being the obviously planted White Water Lily. A species of *Chara* was, however, abundant. A variety of marginal species were seen along the edge of the lake, the most interesting perhaps being *Acorus calamus* (Sweet Flag), flowering freely this year. Some very fine plants of *Osmunda regalis* (Royal Fern) were much admired. These were most probably planted specimens, though a smaller single plant on the opposite bank of the lake might have been self-sown. Other marginal species included *Iris pseudacorus* (Yellow Flag), *Lythrum salicaria* (Purple Loosestrife), *Typha latifolia* (Reed Mace), *Rumex sanguineus* (Bloody Veined Dock) and *Galium palustre* (Marsh Bedstraw).

The planted trees and shrubs included *Tilia platyphylla* (Large-leaved Lime), *Robinia pseudoacacia* (False Acacia), *Castanea sativa* (Sweet Chestnut), *Quercus ilex* (Holm Oak), *Fraxinus ornus* (Manna Ash), *Populus alba* (White Poplar), *P. canescens* (Grey Poplar), *Cotoneaster frigida*, *Platanus acerifolia* (London Plane), *Morus alba* (Mulberry) and *Aesculus hippocastanum* (Horse Chestnut), one tree of this species with the lower branches prostrate and rooting and covering a large area. *Petasites fragrans* (Fragrant Butterbur) was well established under the trees in one part of the park.

Birkin Old Eye, to the east of the Church, yielded a number of interesting plants most of which were already known in the area, the best of these being *Butomus umbellatus* (Flowering Rush), *Nuphar lutea* (Yellow Water Lily), *Oenanthe aquatica* (Water Dropwort), *Scutellaria galericulata* (Skullcap), *Hydrocharis morsus-ranae* (Frogbit), *Sagittaria sagittifolia* (Arrowhead) and *Scirpus lacustris* (Bulrush).

To the west of the church, in the Old Eye and in pools in the vicinity, the following species were recorded:- *Typha latifolia* (Reed Mace), *Scirpus maritimus* (Sea Clubrush), *Scirpus tabernaemontani* (Glaucous Bulrush), *Eleocharis palustris* (Common Clubrush), *Carex otrubae* (Sedge), *Carex hirta* (Hairy Sedge), *Glyceria aquatica* (Reed Grass), *Sagittaria sagittifolia* (Arrowhead), *Ceratophyllum demersum* (Hornwort), *Veronica catenata* (Water Speedwell), *Rorippa islandica* (Yellow Cress), *Epilobium parviflorum* (Small-flowered Willowherb), *Juncus inflexus* (Glaucous Rush), *Potamogeton natans* (Duckweed), *Lemna gibba* (Gibbous Duckweed), *Myriophyllum* sp. (Water Milfoil), *Rorippa amphibia* (Greater Yellow Cress) and *Ranunculus sceleratus* (Celery-leaved Crowfoot). On the Old Eye embankment *Conium maculatum* (Hemlock) was common and a few plants of *Campanula latifolia* (Giant Bellflower) were seen.

Sherburn Willows, near Sherburn in Elmet, is a so far unspoilt area, quite small in extent and consisting of a steep, dry, magnesian limestone bank leading down to a stream, with a small area of marsh. Miss H. Lefèvre sent the following list of plants seen there after a somewhat rapid survey: *Onobrychis viciifolia* (Sainfoin), *Medicago sativa* (Lucerne), *Scabiosa columbaria* (Small Scabious) *Orchis fuchsii* (Spotted Orchid), *Centaurea scabiosa* (Greater Knapweed), *Scrophularia aquatica* (Water Betony) by the stream, *Melilotus altissima* (Tall Melilot), *Ononis repens* (Restharrow), *Bryonia dioica* (White Bryony), *Tamus communis* (Black Bryony), *Allium vineale* (Crow Garlic), *Rosa arvensis* (Field Rose), *Phragmites communis* (Reed) and *Phalaris arundinacea* (Reed Grass), the last two in the bog. In an adjoining clover field Mr. Branson and Mr. Shaw saw two or three spikes of *Orobancha minor* (Lesser Broomrape). *Astragalus danicus* (Purple Milk Vetch) and *Ophrys apifera* (Bee Orchid), both recorded previously, were not seen on this occasion.

NAPPA SCAR, NEAR ASKRIGG, WENSLEYDALE, V.C. 65, 18th July

For this last excursion of the summer we were again fortunate to have excellent weather. Forty-five members, representing eighteen affiliated societies, were present and the whole day was spent in the environs of Nappa Scar and the moor above. At the meeting for reports, after tea at the King's Arms Hotel, Askrigg, when the Chair was taken by Mr. R. F. Dickens, Mr. G. A. Shaw produced an old Excursion Circular for the Union's previous visit to Askrigg and the King's Arms in 1905.

The Divisional Secretary, Mrs. Jean Holloway, was thanked for her work in organising the programme and leading members during the day and the thanks of the Union were also expressed to the landowners who had so kindly given us permission to visit their farm land.

Landforms (C. SIMMS)

Askrigg has given its name to the stable massif of the Pennines north of the Craven faults and south of the Alston block or massif; an upland of varying rock types exposed by the long north Yorkshire dales. This is not the Great Limestone country of the Arnside and Craven districts, but includes many less massive limestones in a sequence described as 'Yoredale' by the pioneer worker John Phillips, a name not now much used even for this, his type district. The stepped benches along Nappa Scar and Whitfield Fell typify this country, and they are on a broader scale than the similar features in Swaledale.

The repetitive sequence through seatearth and coal (these two often missing), limestone, mudstone or shale, to sandstone and seatearth again juxtaposes less resistant shale to more resistant sandstone, and especially some of the limestone. The particular limestone most worked on the day was the Hardraw Scar, a partly ash-wooded feature thanks to its steepness but also to deliberate policy. The shelter provided by the scars for both plants and animals, was a significant factor for the day's observations.

Although the valleyside drainage has been interfered with by man, the deeper gills shelter a variety of wildlife, as do the eroding-out fossil limestone reefs in the bottom of Mill Gill; a case of past sea-forms becoming present-day landforms, although here on a much smaller scale than those better known reef-knolls in Craven. The alternation of more and less resistant, approximately horizontal strata has given rise to more permanent, as well as very many seasonal, waterfalls along the many streams than the maps show.

Vertebrates other than birds (C. SIMMS)

The recorder worked from Carperby (Ballowfield) to Nappa Scar, spending most time amongst the rocks. A brief inspection of woodland edge and riverside added a few species to a rather meagre list.

The only fishes handled were the Bullhead and Common Loach; the former had been feeding on larval Crayfish. A Common Frog noted by Mrs. Holloway was the only member of the herpetofauna found, although vipers had been seen locally recently. The insectivorous mammals noted were Hedgehog and Mole (from definite molehills) only; shrews were heard but not handled. There were no reports of bats. Fox earths at Carperby Pastures and Nappa Scar, a young Ermine (Stoat) seen by Miss Robertson and Weasel trace near Carperby constituted the only wild carnivore records; a recent Otter mask was shown by a resident and feral Domestic Cats are known in the district. Mr. Alderson and others had seen Brown Hare, and Rabbits appeared to be sparingly distributed – some were living above ground in rockfall. Grey Squirrels had been noted, but the only other rodents reported were Field Voles.

Without prior knowledge of the ground, reliable local information, overnight trapping and scope for thorough work, many clues about local vertebrates are passed or missed.

Ornithology (G. E. ALDERSON)

In the high pasture below Nappa Scar several Curlews were calling, with young obviously there. A Kestrel was also seen hovering near the scars. A Tawny Owl was reported, eating moles. Swallows were seen flying low under a group of large Beech and other deciduous trees. Occasional Black-headed Gulls and Lesser Black-backed Gulls flew over, with Carrion Crows and Jackdaw too.

Three of the party visited Summer Lodge Tarn, which lies on the high moor a mile or so north of Nappa Scar. At this height there were some family parties of Golden Plover and Dunlin were also seen, this high moor being a breeding ground for these two species.

Red Grouse, Curlew, Lapwing, Meadow Pipit and Skylark were also present with some Black-headed Gulls from the colony which nests annually on the Tarn. A hundred or so juvenile Black-headed Gulls were resting on the Tarn and many dead young gulls were lying round its perimeter, probably due to their having strayed from the nest and the parents' food supply. A female Tufted Duck swam in the centre, with eight young, and Redshank and Dunlin were seen round the margin. The river bank below Askrigg was visited, the species seen here being Heron, Snipe, Sandpiper, Oyster Catcher, Moorhen, Dipper, Redstart, Redpoll, Mallard, Yellow and Pied Wagtail. Other species seen in the Askrigg area were Rook, Tawny Owl, Pheasant, Grey Wagtail, Whinchat, Robin, Willow Warbler, Tree Pipit, Starling, Tree Sparrow, House Sparrow, Wood Pigeon and Ring Ouzel.

On Monday, 20 July, 1970 I visited Pry House Farm, near Hawes, and was told by the farmer that he had a Corncrake (*Crex crex*) in the meadows in front of the farmhouse. The bird had been disturbed by the grass cutting and had been seen flying from one field to another. Calling had been heard, beginning fairly late and after dark, on several nights. The bird was first heard on 10 July. The meadows had only been cut just prior to 20 July, so the bird may just have had time to hatch eggs before grass cutting commenced. A Corncrake attempting to nest in hill country meadows would possibly have a slightly better chance of hatching eggs, due to the later grass cutting in these areas.

Vascular Plants (H. LEFEVRE and J. HOLLOWAY)

The botanists divided into two parties and covered, between them, both the steep limestone scar known as Nappa Scar and the high land adjoining, which varied between dry grassland and wet acid conditions, over shale. Thus an interesting variety of habitats was encountered within a small area. Few of the plants were in flower at the time of our visit, but 182 species were found within the square.

Typical species of the limestone were: *Helianthemum chamaecistus* (Rock Rose), *Pimpinella saxifraga* (Burnet Saxifrage), *Scabiosa columbaria* (Small Scabious), *Plantago media* (Hoary Plantain), *Poterium sanguisorba* (Salad Burnet), *Anthyllis vulneraria* (Kidney Vetch), *Trisetum flavescens* (Yellow Oat), *Sesleria caerulea* (Blue Sesleria), *Briza media* (Quaking Grass), *Linum catharticum* (Purging Flax), *Leontodon hispidus* (Rough Hawkbit) and *Thymus drucei* (Thyme), with the sedges *Carex flacca*, *C. panicea* and *C. lepidocarpa* in wetter places.

In the limestone screes and the nearby banks were *Dryopteris villarii* (Rigid Buckler fern), *Saxifraga tridactylites* (Rue Leaved Saxifrage), *S. hypnoides* (Mossy Saxifrage), *Draba incana* (Hoary Whitlow Grass), *Minuartia verna* (Spring Sandwort) growing here, as is often its habit, in association with lead deposits. Other ferns seen were: *Cystopteris fragilis* (Brittle Bladder), *Asplenium ruta-muraria* (Wall Rue), *A. trichomanes* (Maidenhair Spleenwort), *Dryopteris filix-mas* and *D. borrieri* (Male Fern), *Polypodium vulgare* (Polypody), *Blechnum spicant* (Hard Fern) and *Pteridium aquilinum* (Bracken). *Sedum acre* (Wall Pepper) was on the scree.

In the more boggy, acid areas between the scars *Pinguicula vulgaris* (Butterwort), *Parnassia palustris* (Grass of Parnassus) and *Triglochin palustris* (Marsh Arrow Grass) occurred occasionally, with the common rushes *Juncus squarrosus* (Heath Rush), *J. acutiflorus* (Sharp-flowered Rush), *J. articulatus* (Jointed Rush), *J. bufonius* (Toad Rush), *J. inflexus* (Hard Rush), *J. effusus* (Soft Rush), *J. conglomeratus* and *J. bulbosus* (Bulbous Rush). In the same type of habitat the following sedges were seen: *Carex binervis*, *C. demissa*, *C. echinata*, *C. hostiana*, *C. nigra*, *C. ovalis*, *C. pilulifera* and *C. pulicaris*.

There were occasional plants of *Hypericum pulchrum* (Slender St. John's Wort), *Digitalis purpurea* (Foxglove) and *Pedicularis sylvatica* (Lousewort) on acid ground amongst common heath grasses like *Sieglingia decumbens*, *Nardus stricta*, *Deschampsia flexuosa* and *Festuca rubra*.

Other interesting plants seen included *Sanguisorba officinalis* (Greater Burnet), *Listera ovata* (Twayblade), *Geranium sylvaticum* (Wood Cranesbill), *G. lucidum* (Shining Cranesbill), *Asperula odorata* (Woodruff), *Campanula latifolia* (Giant Bellflower), *Cirsium heterophyllum* (Melancholy Thistle), *Alchemilla glabra* (Lady's Mantle), *Allium ursinum* (Ramsons), *Lysimachia nemorum* (Yellow Pimpernel), *Stellaria graminea* (Lesser Stitchwort) and *S. alsine* (Bog Stitchwort).

The moor above the two scars bore a typical acid heath community containing *Calluna vulgaris*, *Empetrum nigrum*, *Vaccinium myrtillus* and *Eriophorum angustifolium*.

Bryophytes (F. E. BRANSON)

This was a very interesting area bryologically, and quite a long list of species was made. I have not given the list in its entirety, only a few species from it.

At the base of Nappa Scar there was a limestone flush in which was much *Philonotis calcarea*, and also, but in much less quantity, *P. fontana*. Also here were *Climacium dendroides* and *Bryum pseudotriquetrum*. On the boulders at the sides of the Scar were *Tortella tortuosa*, *Camptothecium sericeum*, *Rhacomitrium lanuginosum*, *Encalypta streptocarpa*, *Brachythecium populeum*, *Neckera crispa*, *N. complanata* and *Isoetecium myurum*.

In the turf were *Mnium marginatum*, *Pleurozium schreberi*, *Polytrichum juniperinum* and *P. piliferum*. A small wood on the slope had a low cliff running through it and the species seen here included *Anomodon viticulosus*, *Tortula intermedia*, *Camptothecium lutescens*, *Ctenidium molluscum* and, on a fallen tree, *Dicranum fuscescens*. A very small piece of *Orthodontium lineare* was on a tree trunk.

Other interesting species recorded were *Rhytidiadelphus triquetrus*, fruiting *Seligeria recurvata* and *Thuidium tamariscinum*. The list of hepatics included *Plagiochila asplenoides* var. *asplenoides*, *Metzgeria pubescens*, *M. furcata*, *Frullania tamarisci*, *Porella platyphylla* and *Diplophyllum albicans*.

Plant Galls (F. B. STUBBS)

The only widespread galls were those of two dipterous species, *Dasyneura urticae* Perris on *Urtica dioica*, and *Jaspiella veronicae* Vallot on *Veronica chamaedrys*. The mite *Eriophyes similis* Nal. was found on leaves of *Prunus padus*.

The most interesting observation concerned the grey woolly terminal galls on *Thymus drucei*, attributed to the mite *Eriophyes thomasi* Nal. Although Thyme was very common in the area, the only plants seen to be affected lay within a patch less than twenty metres in diameter on Nappa Scar, and here they were so numerous as to alter the whole appearance of the plant.

Conchology (L. LLOYD-EVANS)

<i>Carychium minimum</i> Müller	<i>Discus rotundatus</i> (Müller)
<i>C. tridentatum</i> (Risso)	<i>Arion intermedius</i> Normand
<i>Lymnaea truncatula</i> (Müller)	<i>A. fasciatus</i> Nilsson
<i>Cochlicopa lubrica</i> (Müller)	<i>A. hortensis</i> Ferussac
<i>C. lubricella</i> (Stabile)	<i>A. subfuscus</i> (Draparnaud)
<i>Pyramidula rupestris</i> (Draparnaud)	<i>A. ater</i> (L.) agg.
<i>Lauria cylindracea</i> (da Costa)	<i>Vitrea contracta</i> (Westerland)
<i>Abida secale</i> (Draparnaud)	<i>Oxychilus cellarius</i> (Müller)
<i>Vallonia excentrica</i> Sterki	<i>O. alliarius</i> (Miller)
<i>Ena obscura</i> (Müller)	<i>Retinella radiatula</i> (Alder)
<i>Clausilia bidentata</i> Strom	<i>R. pura</i> (Alder)
<i>C. dubia</i> Draparnaud	<i>R. nitidula</i> (Draparnaud)
<i>Balea perversa</i> (L.)	<i>Vitrina pellucida</i> (Müller)
<i>Arianta arbustorum</i> (L.)	<i>Lehmannia marginata</i> (Müller)
<i>Helix nemoralis</i> L.	<i>Agriolimax reticulatus</i> (Müller)
<i>Hygromia striolata</i> (C. Pfeiffer)	<i>A. laevis</i> (Müller)
<i>H. hispida</i> (L.)	<i>Pisidium casertanum</i> (Poli)
<i>Monacha granulata</i> (Alder)	<i>P. personatum</i> Malm

In addition, a single dead shell of *Vitrea diaphana* (Studer) was found on limestone glassland above Nappa Scar.

Mr. A. Norris adds: The occurrence of a single dead shell of *Vitrea diaphana* shows that this species could be widely distributed in the Yorkshire Dales. First discovered in Britain at Oxenber Wood, Austwick, in May 1966 by Mrs. Marjorie Fogan (*J. Conch.* 27: 17-24 (1969)), this species has now been recorded from a number of similar sites in an area around Malham. A search of the Dales could reveal this species as having a wide distribution in West Yorkshire.

The second record of interest from Nappa Scar is the finding of specimens of *Abida secale* (Drap.). Only one specimen of this species has been recorded previously from this range of scars, and that was from a scar on Carperby Moor collected by Mr. Ralph H. Lowe (*J. Conch.* 22: 87-91 (1944)).

Isopods (S. L. SUTTON)

In the quarry at Heugh above Askrigg we made our only notable find, which was *Porcellio spinicornis*, a species typical of quarry faces and dry stone walls on limestone, but not getting much further north than this and certainly not found before at this height (1,100 ft.). Further up, at 1,300 ft., we took *Oniscus asellus* and *Porcellio scaber* under rocks in grassland which was not really alkaline to judge from the flora; while in stabilized limestone scree above this, up to 1,700 ft., we refound these two species and *Trichoniscus pusillus*, plus the oniscomorph millipede *Glomeris marginata*, which rolls up like some of the woodlice.

Y.N.U. BRYOLOGICAL SECTION EXCURSION TO DANES' DYKE, V.C.61

F. E. BRANSON

There are some places where spring seems to arrive earlier than others, and one of these sheltered valleys is Danes' Dyke in the East Riding of Yorkshire. It is wide awake long before other districts which are more exposed to the rigours of winter and the cold winds. The rocky promontory of Flamborough Head is cut off by a great earthwork running north and south and crossed by roads from Filey and Bridlington. Its northern extremity is at a point known as Cat Nab and it proceeds in an almost continuous straight line southwards to the ravine near Sewerby. This great defensive work extends a distance of two and a half miles from cliff to cliff. It is roughly 18 to 20 ft. deep and 60 ft. wide. The area of the promontory cut off is about five square miles. In making it, advantage was taken of a natural ravine – a relic of the Ice Age – which ran southward, but in its northern region where the ground was level a huge ditch was dug, the soil being thrown up to form a rampart or dyke on the eastern side. The name Danes' Dyke is a misnomer, for it was here centuries before the Danish invasion of England, and why it is so-called must be left to the contentions of historians! It is believed to have been made by men of the Bronze Age or even the Stone Age (probably about 3,000 years ago) when the only tools available were picks made from deer antlers and basket-work or hide receptacles for removing the excavated materials. A truly colossal undertaking!

We confined our investigations to the southern end of the ravine from where the Bridlington road cuts the dyke near Sewerby, down to the seashore. Mr. Shaw and Mr. Thompson did go north of the Bridlington road, but found the dyke very much overgrown and difficult to proceed very far along it. The sides we investigated were well wooded and parts of the slopes were wet and marshy.

The bryological flora of the ravine proved extremely interesting. One of the great delights was the large amount of the small thalloid hepatic *Metzgeria fruticulosa* covering the trunks of ancient elder trees. This is the second record for V.C.61, the first having been made by Miss Dalby on old elder at Filey in November 1969. It has a yellowish-green colour becoming bluish-green when dried. It produces an abundance of gemmae from the margin and midrib and from both surfaces near the apex. The clusters of these gemmae could be clearly seen with the naked eye. It used to be described as a variety of the deeper green *Metzgeria furcata* (which we also saw, but not in such abundance), but now enjoys specific rank. *Dicranum strictum*, a moss which we have been recording in numerous places over the past few years, was also quite plentiful. It was found by several members of the party and occurred on elder, hawthorn and crabapple trees. This is a new vice-county record for 61. Another good find was by

Mrs. Gow and in another place by myself (on tree trunks) of *Orthotrichum pulchellum*, a very small moss with an attractive orange-coloured peristome. This species is in brackets in the British Bryological Society's *Census Catalogue of Mosses*. If a vice-county record is enclosed in a round bracket () the species in question has not been seen in that vice-county for a long time (usually since 1900), and may therefore be treated as a vice-county record. I see that on the occasion of the Y.N.U. meeting at Flamborough in June 1906 it was recorded from Danes' Dyke by J. J. Marshall. He first found it there in 1900 with William Ingham. The last record was in 1909 from Burton. Some *Seligeria* collected is said by Mr. Shaw to be almost certainly *Seligeria paucifolia* (no capsules were present). This was also seen at the 1906 meeting. Two mosses collected by myself were *Isoetecium myosuroides* (covering a fallen trunk) and *Cirriphyllum piliferum* from a bank. There was also a quantity of *Plagiothecium sylvaticum* collected by myself and Mark Seaward – also earlier by Mr. Edward Little (see *Naturalist* No. 912). This used to be very difficult to determine in the absence of capsules (which I have never yet seen) from other closely allied species, but the cells in the lamina are much shorter than in other species, the characteristic said to be reliable by Dr. S. W. Greene in his classification of the genus. Most of the species seen were those which constitute a woodland flora. At the 1906 meeting (lasting for three days), 42 mosses and 6 hepatics were found. At this present meeting 47 mosses and 10 hepatics were found, although some of those recorded at the earlier meeting were not seen this time. Species found (not mentioned above) are tabulated below.

Nomenclature and arrangement follow:

Census Catalogue of British Hepatics (4th Edition) by J. A. Paton

Census Catalogue of British Mosses (3rd Edition) by E. F. Warburg

HEPATICAÆ:

Thalloid:

Conocephalum conicum
Lunularia cruciata
Pellia epiphylla
P. endiviifolia

Foliose:

Leiocolea turbinata
Lophocolea bidentata
L. cuspidata
L. heterophylla

MUSCI:

Acrocarpous:

Atrichum undulatum
Fissidens bryoides
F. taxifolius
Ceratodon purpureus var. *purpureus*
Dicranella varia
D. heteromalla
Dicranoweissia cirrata
Dicranum scoparium
Tortula muralis
Barbula unguiculata
B. tophacea
Weissia controversa c.fr.
Funaria hygrometrica
Orthodontium lineare
Bryum rubens
B. capillare
Mnium hornum
M. longirostrum
M. undulatum
M. punctatum
Aulacomnium androgynum

Pleurocarpous:

Thuidium tamariscinum
Cratoneuron filicinum
C. commutatum var. *conmutatum*
Amblystegium serpens
Acrocladium cuspidatum
Camptothecium sericeum
Brachythecium glareosum
B. rutabulum
B. rivulare
B. velutinum
Eurhynchium striatum
E. praelongum
E. praelongum var. *stokesii*
E. swartzii
Pseudoscleropodium purum
Plagiothecium succulentum
Hypnum cupressiforme
H. cupressiforme var. *resupinatum*
Ctenidium molluscum
Rhytidiadelphus triquetrus

I am grateful to Miss M. Dalby, Mr. Mark Seaward, Mrs. M. Gow and Messrs. G. A. Shaw & E. Thompson for sending in their lists, which I have consolidated above. My thanks are also due to Mr. A. C. Crundwell for checking the *Orthotrichum pulchellum*.

AUTUMN FORAY, RIPON; SEPT. 4-8, 1969

W. G. BRAMLEY

Some fifteen members and friends enjoyed the long weekend of pleasant weather and rural scenery surrounding Ripon. After a long absence the return of P. D. Orton was appreciated and the list of agarics is mainly due to him. We were glad to have both him and Mr. Richardson with us. Praise must also be given to our Secretary, Dr. Hering, who turned up in spite of having only just arrived back in the country from Africa a day or two before the meeting. Finally, to those who by their collecting and other activities helped with the preparation of this report, my grateful thanks.

Studley Royal and Fountains Abbey were visited on the Friday and again on Monday morning. A nice group of *Grifola giganteus* soon saw the photographers at work. This large polypore does not appear to have been seen on our forays for a few years. Another of the same group, *Polyporus sulphureus*, was frequent, especially on old Yew trees. In amongst the wet lawns near the lakes a number of small agarics were diligently sought for.

Tanfield Lodge woods were rather barren, but a species of *Rubus* provoked a lot of discussion. After the meeting it was tracked down to *R. phoenicolasius*, the Wineberry, evidently a throw-out from a garden. After lunch a move was made higher up the valley to Hackfall where most of the party got tangled up in the heavy scrub on the steep slopes but one or two took an easy route towards the river and returned with *Strobilomyces* in good condition. Apparently never in large numbers there are only half a dozen Yorkshire records for this striking fungus in the past thirty years. It was gratifying therefore when it turned up again next day at Grantley and an old specimen was seen at Fountains on the Monday.

The grounds at Grantley Hall were enjoyed but not a lot of fungi were noted, though *Strobilomyces* had the photographers nearly falling over one another, the site being on a very steep slope. Spa Gill provided a number of interesting species but again dense vegetation and brush proved too much and we did not penetrate as far afield as on other visits. A short diversion to Winksley added little to the collecting.

A final visit to Fountains added little to the list and after a picnic lunch members regretfully broke up and made their "homeward way".

In spite of the previous hot and dry summer fungi were more plentiful than expected and a total of some 130 species of agarics testified to the work especially of Mr. Orton. Some half dozen of these were found under Dog's Mercury, which P.D.O. finds a particularly interesting habitat. These are marked * in the list.

No attempt has been made to separate the two vice-counties collected in, but Fountains, Grantley and Winksley are in V.C.64, Tanfield in V.C.65, and Hackfall on the boundary of V.C.64. and V.C.65.

The other species listed have few records for the county but are probably more frequent than suggested by my records. It is to be hoped that the new *British Fungus Flora* now in course of publication, may enable us to identify more of our collections correctly, especially now that postal charges are not only more expensive but delay often causes the specimens to reach an expert in a condition once described of some of my own as "mush."

F = Fountains Abbey and Studley Royal
G = Grantley and Spa Gill
H = Hackfall
W = Winksley
T = Tanfield

c = dung of cow
d = dung of fallow deer
r = dung of rabbit

‡ not apparently recorded for Yorkshire
* under *Mercurialis*

AGARICALES (P. D. Orton)

Amanita phalloides, F.T.

A. inaurata, F.

Boletus granulatus, T.

B. reticulatus, T.

Coprinus cineratus, W.

‡ *C. exstinctorius*, F. on *Ulmus* log

C. hiascens, F.G.

C. narcoticus, W.

C. stercorarius, Fc.Hd.

Cortinarius rigens, G.

‡ **Flammulaster pusillima*, T.

Galerina ampullaceocystis, W.

G. vittaeformis, T.S.

‡ **Hygrophorus hymenoccephalus*, T.

H. lacmus

Inocybe cookei, G.

‡ **Laccaria tortilis*, T.

- †*Lactarius acerrimus*, F.
 **L. azonites*, F.
L. chrysorheus, T.
L. circellatus, G.
L. fulvissimus, T. under *Quercus*
 †**Leptonia cephalotricha*, T.
 †*L. pyrospila*, F.
Naucoria striatula, G.
N. subconspersa, G.
Pholiota flammans, W.
Pluteolus aleuriatus, F.T.
 †*Pluteus boudieri*, F. on *Fagus*.
 †*P. depauperatus*, G.
P. lutescens, H.T.W.
 †*P. minutissimus*, G.
 †**P. pearsonii*, F.
P. phlebophorus, T.
 †*Psathyrella leucotephra*, W.
 †*P. piluliformis* (Bull. ex Merat)
P. D. Orton (1969), T.
P. prona, W.
Russula aeruginea, G.
R. curtipes, T.
R. farinipes, F.G.
R. foetens, F.T.
R. laurocerasi, F.T.
R. lepida, F.
 †*R. pseudodelica*, F.
Strobilomyces floccopus, G.H.F.
DISCOMYCETES (W. G. Bramley & M. Richardson)
Ascobolus albidus, Tr.
A. immersus, Fc.
Ascophanus microsporus, Fc.
Ascozonus woollopensis, Tr.
Humaria hemisphaerica, H.
Peziza emileia, F. (certe R. W. G. Dennis)
P. petersii, F., on burnt ground
Scutellinia trechispora, G.
Thelobolus nanus, Fc.
T. stercorius, Tr.
PYRENOMYCETES
Leptosphaeria libanotis, on *Angelica*, G.
Sphaeronaemella fimicola, Hd; Tr.
FUNGI IMPERFECTI (W. G. Bramley)
Acladium conspersum, on twigs, H.
Bactridium flavum, on old wood of *Fagus*, G.
Monotosporium sphaerocephalum, on wood, F.
Ovulcaria bistortae, on *Polygonum bistorta*, F.
Rhopulomyces elegans, Fc.

BOOK REVIEWS

The Medusae of the British Isles: Vol. 2, by F. S. Russell. Pelagic Scyphozoa, with a supplement to the first volume on Hydromedusae. Pp. xii & 284 with 16 plates (6 in colour) and 128 text figures. Cambridge University Press, 1970. £7.

Sir Frederick Russell published his *The Medusae of the British Isles* in 1953. Though it dealt only with the Hydromedusae it appeared as a complete work, so the publication of a new book as its volume 2 is inconsistent. The new volume is however a welcome addition to the work for it deals with the Scyphozoa (which were omitted from the first volume) and includes a supplement which brings the first volume up to date.

The first impression given by the new volume, as by its predecessor, is of handsome production. The format is large. Great care has been taken over the line drawings and most of them are attractive in appearance as well as being clear and informative. There are six full-page coloured plates, five of them coloured drawings by the author, which are the more pleasant for being printed on matt paper. There are also nine pages of black and white photographs which are rather unattractively contrasty but extremely clear. This must plainly have been an expensive book to produce and only a grant from the Royal Society has made it possible for it to appear at a price of seven pounds.

The book includes all one expects in a good monograph. There are keys for identification, lists of synonyms, descriptions and notes on habits and distribution. This does not need very much space as there are only fourteen species to describe. However, the basic information is supplemented by very full accounts of the anatomical peculiarities of the species which are obviously largely based on the author's painstaking observations. These accounts necessarily repeat information given in the formal descriptions, but they do add very substantially to it. There are also notes on such investigations as have been made of the physiology, histology, development and feeding habits of each species and there are good illustrations of stages of development, but there are strangely almost no illustrations of microscope sections, none of apparatus or physiological records, and no graphs. Without such illustrations the book is incomplete as a record of modern knowledge of British Scyphozoa, but the missing information can easily be found by examining the papers referred to in the text. Indeed the book seems to be as complete as a review of literature on British Scyphozoa, as it is as a record of their gross anatomy.

R.MCN.A.

A Field Guide to the Butterflies of Britain & Europe by L. G. Higgins and N. D. Riley. Pp. 380 with 760 colour illustrations on 60 plates. Collins. 42/-.

It is several years since, in anticipation of a holiday in Spain, I wrote to a well known entomological bookseller asking if he had a simple book on the butterflies of Europe. He was unable to help even with a book having the text in French or German, so I collected very few insects and had little idea what they were. Now the answer to my request has arrived, Higgins and Riley have produced a book which exactly answers my needs and those of any other butterfly enthusiast who ventures beyond the shores of these islands. They have included the North African coast, the Azores, Canaries and Madeira, the two latter being increasingly popular resorts for the British.

This book is the latest addition to Collins' series of Field Guides and everyone who has used these, whether for birds, flowers or insects, knows that he can expect a very high standard of presentation indeed. This volume maintains the standard in every way. It is a concise book, intended to aid in the identification of any butterfly taken, the text is therefore short and very much to the point. For each species the scientific name is followed by an English name and the popular name in various other languages. Very short paragraphs (often only one line) then follow, giving the range, description, time of flight, habitat and distribution.

The description which also refers to major variations is backed up by the superb colour plates which show both upper and underside, both sexes if the difference is significant, and also different geographical forms where these have been separated as subspecies. The paragraph on distribution is supported by a distribution map for each of 371 species out of the 381 covered by the book, and the maps give the general shape of the distribution of the species throughout the area.

There is a good system of cross reference between the text and plates and between the text and maps, though it would have been a further improvement to have given the map numbers on the plate captions. Your reviewer was at first baffled by the omission of Iceland from the distribution maps but soon found a note that there are no indigenous butterflies in Iceland! Another comment, this time from the preface must make most of us feel very humble: the authors acknowledge the loan of 22 specimens for the production of illustrations, but apart from this all the 750 specimens used are in the collection of Dr. Higgins, a truly monumental achievement by any standards.

This is certainly a book that any British lepidopterist should have on his shelf ready to pack whenever he crosses the Channel, and also to familiarise himself with those species which are not on the British list but may occasionally reach our shores and perhaps go unrecognised due to a superficial similarity with some indigenous species. He will also find it increases his enjoyment of the accounts frequently appearing in our journals describing continental collecting expeditions. The authors however appeal to an even wider readership as, with a short introduction to the study of butterflies, they open the way for naturalists of all kinds to take a real interest in the butterflies they see on the continent of Europe.

C.I.R.

Life on a Little-known Planet, by Howard Ensign Evans. Illustrated by line drawings by Arnold Clapham. Andre Deutsch, 1970. 50/-.

Professor Evans's book is an excursion into the many byways of the fascinating but little-known world of the insects. The insect population is immense, the byways many and mainly unexplored. In England there are few insects to be seen in the fields in winter but it has been calculated that a single acre of pasture in November will contain 17,825,000 beetles and 248,375,000 springtails – and, of course, other insects besides. That calculation was made in 1943, before the advent of modern insecticidal sprays. There may now be fewer, but even a reduction by half would leave an impressive total. Impressive as the numbers are, however, it is the life of the insects that fascinates. The forms and colours we can see and appreciate: the patterns of behaviour are more complicated and may not even be recognised as a pattern or part of a pattern for the insect world is very different from that of man.

How many people know that there are "left-winged" crickets just as there are left-handed men and women? That crickets chirp is well-known. Different species chirp with a different pulse-rate per second and with a different number of pulses per chirp and so identify themselves to their prospective partners. Male crickets chirp (or "sing") by rubbing one forewing over the other. Each forewing has a raised vein, the "file", which is rubbed against a hardened portion of the inner margin, the "scraper", of the other forewing. Most sing with the right wing over the left. A few are left-winged and as the file on the left wing is not as well developed as that on the right wing the song

is weaker and less "musical". They seem to get by, but the American Katydid is normally left-winged and the occasional right-winged individual is not so fortunate. Unhappily, it cannot sing at all and so cannot attract a mate!

Many of the most interesting aspects of the lives of insects are those connected with attraction, courtship and mating. The crickets, like the grasshoppers, sing. The glow-worm signals with light. There is only one species in England so the business is uncomplicated. In America there are many species which are quite inseparable as museum specimens but which can be distinguished by the pattern of flashes of light which they emit. When courting the male firefly (allied to our British glow-worm) flies at night, flashing his light. The female responds; the male is attracted and continues flashing his lamp as he approaches the female. He reaches her and mates with her. Inter-breeding is prevented by the different pattern of flashes. One firefly produces a series of three slow flashes at intervals, another produces a long flash while jerking rapidly from side to side, and so on. The female will only respond to a male of her own species. But there are two genera involved, *Photinus* and *Photuris*. Sometimes a female *Photuris* will respond to a male *Photinus*. The *Photinus* is deceived and attracted, a fatal attraction because the *Photuris* devours him. The crickets and fireflies are examples of two types of signal used by insects to attract and recognise their proper partners.

Taxonomists can only separate many species by a very critical visual examination. The insects themselves may rely on visual attraction as a preliminary sign for recognition and most people will be familiar with this aspect of the courtship of white butterflies. The butterflies will dash at each other, a short aerial battle takes place and then the participants break off the engagement. They have, of course, been attracted by sight. Close proximity has not provided the exchange of scent between male and female of the same species that would have led to mating so the two individuals have parted. Experiments with Fritillary butterflies have revealed that the male is not attracted particularly to the peculiar pattern of the female's wings but to the contrasting colours, black and orange, and movement. A revolving bobbin, painted with alternate bands of black and orange and turning at the rate of 75 alternations a minute is much more attractive to the male Fritillary than the colour pattern of the wings.

It would be possible to select many more examples from this book but these must suffice. Professor Evans has selected his material from monographs, scientific journals and other sources and he provides adequate references for those who wish for more detail. Those who read his earlier book, *Wasp Farm*, will remember his refreshingly clear style, his dedication to his subject and his ability to convey his enthusiasm to the reader. It is not possible to say more than that all readers of *The Naturalist* should surely find this an enthralling book.

J.H.F.

The Scottish Lochs by Tom Weir. Pp. 256, with 105 photographs. Constable, 1970. 35/-.

Few naturalists require to be reminded that Tom Weir's usual beat is mountains; so it is refreshing and unexpected to have from him an account of those stretches of water on which he has so often looked down, the freshwater lochs of his native land. In this work he has set himself certain geographical limits; the lochs dealt with are all north of the Forth-Clyde valleys; those north of Inverness, the Shetlands and the Orkneys, and all the western islands are ruled out. Thus the content of this volume is, in effect, the lochs of the central mainland of Scotland.

Of the 13 chapters, one is devoted to Loch Lomond, another to the two western lochs, Shiel and Morar, which are all but sea lochs, and a third to the high lochs and lochans of the Cairngorms; each of the remaining ten chapters deals with lochs in the catchment area of one of the larger rivers. On all of these the book is packed with information; the vital statistics of length, breadth, depth and even volume are here, and much of the history, folklore and legend as well. The author is a naturalist, and while his main preoccupation is clearly with their animal life, the more noteworthy plants also find a place.

Apart from the inevitable differences of opinion about the spelling of Gaelic place-names, there are few misprints, but in the information about youth hostels on p. 27 Inversnaid should surely read Inverbeg. The book is splendidly illustrated by over 100 of the author's photographs.

R.M.

Highland Birds, Catalogue No. Red 74M, **Sounds of the Countryside**, Catalogue No. Red 60M, **Wildlife of East Anglia**, Catalogue No. Red 83M, by **Eric Simms**. **Recollections and Recordings**, Catalogue No. Red 66M, by **Ludwig Koch**, all B.B.C. Radio Enterprises, London 1970. 33 $\frac{1}{3}$ R.P.M. at 21/6d. each.

Having heard most of the sounds recorded on these discs, many of them at the places where they were obtained for the collections, and knowing the recorders, these publications by the B.B.C. have a special interest for me. Although they were first heard on the air in differing programmes the tracks from the archives are, on these records, well arranged under geographical, seasonal and personal titles.

As one would expect from such experts as Ludwig Koch and Eric Simms, the recording is of a high order of competency and is frequently artistic. Where tracks from other sources are used they have obviously been chosen with great care. Each record is divided into separate groupings and plays for about fifty minutes.

The aim of this series is to entertain and evoke memories, although one can gain considerable instruction from the records. Naturally the evocative effect depends to a large extent on the experience and personality of the listeners, each person having their own favourite countryside sounds.

Some of my own choices from the records by Eric Simms are the wonderful series on the parents and young Stone Curlews – I photographed the microphone in position on the nest – the lovely winter sounds of Blakeney Harbour, particularly the voices of Brent and White-fronted Geese, the latter sounding typically querulous. It is pleasant to hear the song and calls of the Redpoll, a bird that seems to be increasing in many areas. The calls of the adult Peregrine and the eyasses cannot but thrill anyone interested in birds, while the cork-popping performance of the Capercaillie is always good for a laugh.

Of the recordings of animal voices the amorous vixen's yell reminded me of a night spent in one of our dales, and the strangely attractive singing of the Grey Seals brought memories of December visits to the Farne Islands and June days on Fetlar. It is easy to understand how the weirdly beautiful sound has become an integral part of northern folk-lore.

Ludwig Koch's record has the same playing time as the others, but it is very different in style and content. The first side is devoted to discussions between Desmond Hawkins, and in one case James Fisher, and Ludwig, these being illustrated with some of the latter's recordings. To a naturalist some of the interviews seem rather tritely contrived – the one Mr. Fisher conducts on Shetland and its birds being a notable exception – but it must be remembered that the record is an extended version of the radio broadcast that marked Ludwig Koch's 88th birthday on 14th November 1969, and this was aimed at an average audience rather than the specialist. Many will recall Ludwig Koch as a radio personality of the post-war years and buy this record to hear again his highly individual rendering of the English language, also to listen to his stories of dangers, disasters and triumphs that never lose anything in the telling.

Side two is divided into 35 separate cuts, all but two of which are of bird sounds, and provides a feast for the ornithologist. Needless to say all the recordings are good, and some are perfect sound pictures. One has only to listen to the wild music of the Kittiwake colony, backed by the sounds of breaking waves, to be transported to one's favourite sea cliff. Whether of Bonxie, Bittern or Buzzard the recordings ring true.

All the records are well worth their price. To those who know our birds and animals they will bring lasting pleasure with many memories, and for those less familiar with denizens of our countryside, they will be an added incentive.

A.G.

Fossil Collecting, by **Richard Casanova**. English edition prepared by Elaine Bryant. Pp. 142 with 36 plates and 83 text figures. Faber and Faber, 1970. 10/–.

This is the paper-back edition of a volume which first appeared in 1960. It offers a rather summary treatment of the classification of fossils and of the geological time scale based on fossil evidence. The information in each section tends to be rather too concise and perhaps too much attention is paid to animal groups which are very rare or which the average collector is never likely to find. To anyone, however, who has some knowledge of biology, and is interested in fossils, it can be recommended while the price makes it accessible to everybody. The plates are excellent but the diagrams illustrating past conditions in Britain have little meaning.

H.C.V.

The Assaults on our Senses by John Barr. Pp. 218, with 21 black and white photographs. Methuen, 1970. 50/-.

In our pollution conscious times the appearance of another book on the subject of environmental upsets is often a non-event. Not so with this book however, for here is a work which strikes at the roots of pollution, in the widest sense of the word.

The assaults on our senses which concern the author cover every sense we possess and every aspect of the subject from multi-decibel noise to bad smells is examined. It is a difficult book to review, but its content covers almost every eventuality of pollution in daily life. In the last month my natural history outings have taken me from the hills of Perthshire to the Hampshire coast. On the former the silence can be almost tangible, on the latter the noise is dreadful. The celebrated Farlington marshes near Portsmouth, amongst the greatest ornithological sites in Britain, have a background of motorway traffic, aircraft and powerboat noise which overpower rather than assault the senses. Birds, fishermen, water skiers and yachtsmen share this never-never land, through which birdwatchers pursue their bent. The sign-scapes of most towns, with advertisements and road signs jumbled together, the wire-scapes, whether for power transmission or access barring, the effluent of the affluent and a thousand other present-day commonplaces make this book what it is. It is a book of today and, one hopes, a pointer to better times ahead.

To read of relatively youthful Americans rushing towards premature deafness through being subjected to too much noise in early life, or of the loss of hedgerows and even the changing taste of food, strikes a warning note to which society must eventually respond. Where this response is to come from is something of a mystery at present, but after reading this book one is left with feelings of fury that this situation has been allowed to develop and frustration at not being able to do something to correct it. Mr. Barr has done a great service in collecting together and committing to print this catalogue of current ills – perhaps one day he will be able to report on a cure, or even a slight improvement.

T.M.C.

Before Nature Dies, translated by Constance D. Sherman from the original text by Jean Dorst, 'Avant que Nature Meure'. Pp. 352 with 16 colour photographs, 77 in black and white, and 75 text-figures. Collins, 1970. 63/- net.

This book provides a far-ranging and comprehensive survey of the problems created by the collision between man and his environment. The substance of the book is essentially factual and the facts, which are considerable, are presented in a straightforward and unemotional way. In a brilliantly successful way, Rachel Carson's *Silent Spring* awakened a vast audience by the very intensity of its message, but Jean Dorst's more objective and balanced approach is surely now appropriate. This book is a particularly significant contribution, because the depth of scholarship of its author is so apparent. As something of a bonus, the illustrations are both numerous and interesting.

In its original form, this book was published in 1965. Had it been written *de novo* today, the rather brief chapters on pests and pesticides (20 pp.), and pollution (22 pp.), would surely have been appreciably longer. Nevertheless, both text and bibliography (a useful compilation of 145 items), have evidently been updated to some extent. This book will be of value both as a source of ammunition for the campaigning conservationist, and for all who want to be reminded of the enormous complexity and sheer size of the problems involved in protection of the environment against man and, in the last analysis, protection of man against himself.

J.D.L.

Pathogenic Root-Infecting Fungi by S. D. Garrett. Pp. ix + 294. Cambridge University Press, 1970. 75/-.

For the last thirty years Dr. Garrett has been recognised as a leading authority on soil-borne fungi pathogenic to plants. His earlier works are well known but the present volume is entirely new, partly because he is dealing with a very active and productive field of research but perhaps more importantly because great experience now allows the author to stand back from the detailed results of experimentation and by judicious use of hypothesis and established fact, to present a coherent account of the life of this important group of fungi.

The biology of both specialised and unspecialised parasitic fungi is traced and discussed, starting with their growth development and survival in the competitive world of the soil and their establishment and progress within the host plant. A good chapter on the vascular wilt fungi gives an insight into the complexities of host-parasitic physio-

logical relationships. Dr. Garrett has never shrunk from the difficult task of trying to fit the jigsaw of isolated facts into a composite picture of the life of this group of organisms and he has succeeded in this book in producing a readable but very well-documented account of this particular microbial area. Not everybody will agree with all his interpretations but the fact that they have been attempted with such regard for the available evidence is a considerable scientific achievement which should be studied by students of whatever age.

The work is very readable and an excellent guide to further study.

J.H.W.

Organisms and populations edited by J. H. Gray. Pp. 142 with 64 figures and plates. (Laboratory Guide). 16/-.

Maintenance of the Organism edited by C. F. Stoneman. Pp. 158 with 87 figures and plates. (Laboratory Guides). 16/-.

The Developing Organism edited by Margaret K. Sands. Pp. 105 with 38 text figures and photographs. (Laboratory Guide). 13/-.

Control and Co-ordination in Organisms edited by John A. Barker. Pp. 127 with 63 text figures (Laboratory Guide). 13/-.

Teachers' Guide I edited by W. H. Dowdeswell. Pp. 213 with 18 figures. 25/-.

Key to Pond Organisms by Alison Leadley Brown. Pp 45 with 128 figures. 6/-.

Topic Reviews on Circulation by W. H. Freeman. Pp 43 with 23 figures. 5/-.

Topic Reviews on Control of Breathing, by Margaret K. Sands. Pp 17 with 6 figures. 4/-.

Topic Reviews on Metabolism by C. F. Stoneman. Pp 35 with 16 figures. 5/-.

Nuffield Advanced Science Series: Penguin Books.

Teachers' Guides I and III. Pp 411 with 174 figures and plates: pp. 266. 55/- and 35/-.

Activities Pack I containing five booklets. 29/-.

Nuffield Combined Science Series : Longman/Penguin Books.

These books are part of two series, one covering advanced biological work for the sixth form, and the other combined science for 11-13 year olds. Each set is produced through the Nuffield Foundation's Science Project.

Those who are familiar with the books already produced for O-level will be prepared for the high standard of print and lay-out which is a hallmark of all the publications of the Nuffield Science Project. These are no exceptions. The A-level laboratory guides each have a preface making its function quite clear, namely to guide and stimulate the sixth-former to investigate biological material and phenomena through an experimental and mathematical approach. The practical work is clearly summarised at the start of each chapter and the text is abundantly illustrated with diagrams, photographs, and tables. A careful index enables topics to be found easily. With the help of these guides the student is able to work independently and to pursue subjects of particular importance or interest using the key, the topic reviews and the excellent list of references included at the end of the chapters. The Teachers' Guide is full of helpful suggestions for teaching methods, materials and practical details as well as setting out the aims behind the whole course. The series covers topics of such basic biological importance and includes so many examples of significance, both economic and social, that these would be excellent source books for any teacher at sixth form level.

The combined science course attempts the difficult task of linking together the three sciences for the younger age groups, in such a way that the result will form a firm foundation for whatever science course is to follow. The Teachers' Guides I and II are packed with ideas and information from which the teacher can plan his or her own course and some guidance is given as to how this can be attempted. It is intended that the course shall be taught by a single teacher so that practical details and factual material is included for those stepping outside their own particular science. Much of this is given in Teachers' Guide III together with references, apparatus and suggestions for visual aids. The activities packs are in the form of booklets which can be handed out to the children and are very well illustrated by drawings of the kind to attract eleven to thirteen year olds. Considerable thought has been given to the format of the series. Teachers' Guides I and II are produced in a form which allows pages of notes and cuttings to be inserted and the activities pack booklets are punched so that they can be used as single sheets. Perhaps one criticism is that these booklets are unlikely to stand up to hard wear and the numbering on the front of the pack is difficult to distinguish. The material included however as with all Nuffield Science publications has been fully tested in schools and provides much help and stimulation for all science teachers of this age group.

M.S.G.

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THE YORKSHIRE NATURALISTS' UNION

Y.N.U. NEWSLETTER

The Y.N.U. Newsletter, sent to all Full members and Affiliated Societies, is published three times a year: February, May and November. Its aim is to provide a means of intercommunication between all members by giving, for example, reports on Y.N.U. and Society meetings and activities, items of broad Natural History interest, details of all types of surveys and enquiries. All items should be sent to the Newsletter Editor: Mr. H. T. James, 238 Sigston Road, Beverley, Yorks.

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The Yorkshire Naturalists' Union wishes to appoint an Administrative Officer to deal with routine clerical tasks at present undertaken by the General Secretary and the Assistant Treasurer and Membership Secretary. An honorarium is to be offered to the successful applicant and any person who is interested in this work is invited to write for further information to the Chairman of the Executive Committee, Y.N.U., Mr. Roy Crossley, 2 Mill Rise, Swanland, North Ferriby, East Yorkshire.

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THE NATURALIST

FOR 1971

REPTILES AND AMPHIBIANS IN THE SHEFFIELD AREA 1969-70

D. HERRINGSHAW

It is now well over fifty years since Alfred Denny, in the 1910 *British Association Handbook and Guide to Sheffield*, summarised the status and distribution of reptiles and amphibians in the region around the City. Conditions within the area have changed enormously since that time but little or no further investigations have been carried out upon the present distribution of these groups.

In 1968 an attempt was made to bring up-to-date all the information then known about the status and distribution of the four reptiles and five amphibians present within the region, and this was subsequently published as part of the Sorby Natural History Society's Jubilee volume, *The Natural History of the Sheffield District*.

Preliminary evidence obtained from data gathered during the course of writing the article seemed to indicate the possible decrease of certain species from many of the haunts in which they had become familiar over the years. Partly as a result of this knowledge and partly because it was felt that such an investigation was long overdue, a survey was organised which was to run for the trial period of one year, after which – if successful – it would be continued for as long as was necessary to produce enough data to assess accurately the status and distribution of all species of reptile and amphibian found within a twenty mile radius of the City of Sheffield. The results obtained after this trial period proved to be so useful that the survey was continued, in a modified form, into 1970.

In this account I have very briefly described the main lines of investigation and their relative merits. The main part of the paper summarises the results of the survey gained after two years as they concern that part of the area of interest to the Y.N.U. A conclusion is given at the end of the account.

METHODS

In order that coverage of the region should be as complete as possible six main lines of investigation were tried. These can be summarised thus;

- a. Data derived from the writer's personal fieldwork.
- b. Information supplied by members of the local natural history society via a returnable record sheet.
- c. Museum records.
- d. Information from the general public as a result of a report in a local paper.
- e. A plea for assistance to certain other local natural history societies.
- f. An appeal to most schools within the City boundary for reports of sightings, particularly of the local amphibian population.

The first two methods proved by far the most useful. The third is, or should be: one of the methods used in most surveys and co-operation with the local museum is really essential; in this case the amount of data received was rather limited though certain information, particularly that concerning sightings of reptile species, proved most valuable. Method d. despite requests for record sheets from some interested members of the public, has so far provided little information, although probably it will be used again in the future. There was no response to the appeal to local natural history societies. The last method, an appeal to Sheffield schools, although proving fruitless, may in the future produce results if the time can be found for personal visits to at least a few of the schools in question.

RESULTS

The area to which these remarks apply is that covered by the twenty, ten kilometre grid squares of which the Sheffield square forms roughly the centre (see Figure 1.); i.e. it stretches from Barnsley in the north to Matlock in the south, its eastern and western

extremities being the area just to the east of the Rother valley and the moors along the Derwent and its tributaries. The principal river valleys in the area are those of the Dearne, Dove, Rother, Don and its tributaries and a large section of the Derwent and its tributaries. Four major rock types are exposed within the region covered by this

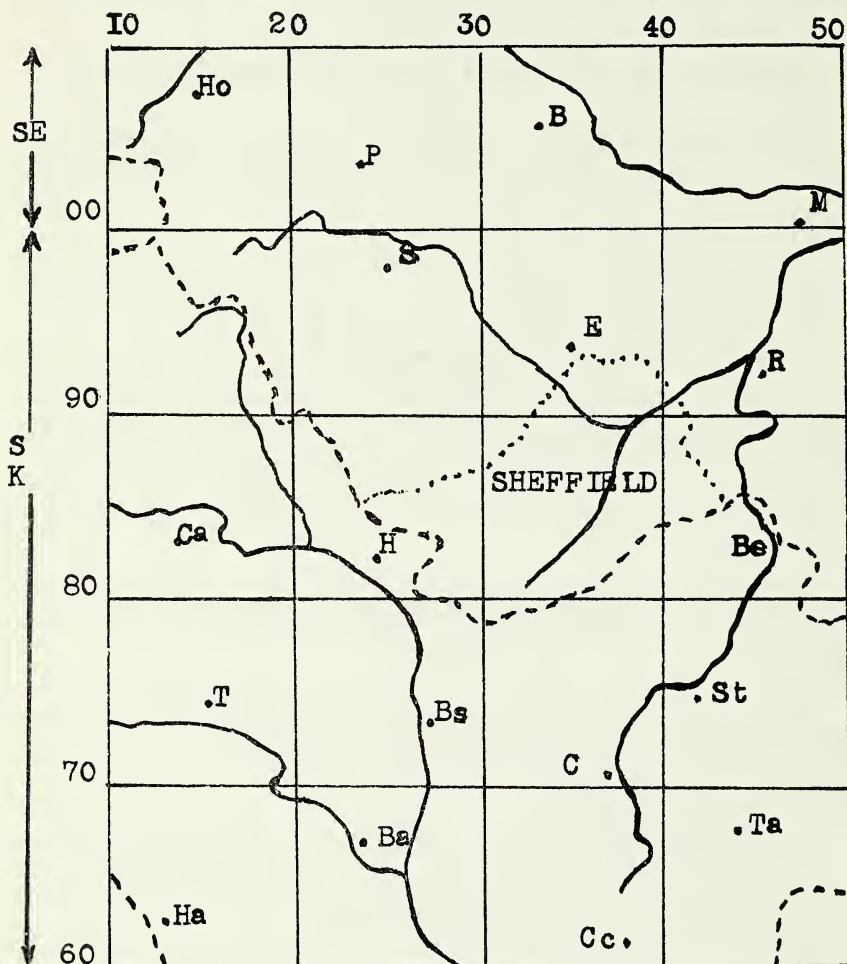


Figure 1. Map showing area covered by this account.

Scale: 1 inch = 8 miles (approx.)

KEY

.....	County boundary	C. Chesterfield	Ha. Hartington	S. Stocksbridge
-----	Sheffield City boundary	Bs. Baslow	H. Hathersage	R. Rotherham
B.	Barnsley	Ca. Castleton	Ho. Holmfirth	St. Staveley
Ba.	Bakewell	Cc. Claycross	M. Mexborough	T. Tideswell
Be.	Beighton	E. Ecclesfield	P. Penistone	Tn. Temple Normanton

survey; these are the Millstone Grit Series, the Coal Measures, the Carboniferous Limestone and the Permian rocks typified by the Magnesian Limestones. Four counties are represented, approximately half the area lies in Yorkshire, just under half in Derbyshire, and Nottinghamshire and Staffordshire are represented on the extreme eastern and western margins of the survey region.

The probable distribution of the nine species at the beginning of this century has already been dealt with in a publication referred to earlier (Herringshaw, 1968) so little reference is made to this when the survey results for each species are discussed below. However whenever possible the results have been compared with those obtained from casual recording in the last few years.

The nine species are treated systematically, details are given of the grid squares in which they have been recorded together with any other additional information and an attempt has been made to discuss the relative importance of the data in the conclusion at the end of the paper. A summary is also given in the form of an appendix, showing the species which are definitely known to be present within each 10 km. grid square covered by this account.

AMPHIBIANS

THE CRESTED OR GREAT WARTY NEWT (*Triturus cristatus*)

This species has been proved to be well established in certain localities within five of the twenty 10 km. squares; these are the Barnsley (SE.3/0), Beighton (SK.4/8), Staveley (SK.4/7), Baslow (SK.2/7) and Hartington (SK.1/6) squares. Earlier reports of the crested newt for 1966 and 1967 mention its presence in the Ecclesfield (SK.3/9) square, however although all the most favourable habitats where the species was formerly present were examined thoroughly by the writer it would seem to have either completely disappeared, or be so restricted in distribution and few in number as to have been overlooked. The total absence of records from elsewhere in the region would suggest that, though no doubt certain localities have been overlooked, the crested newt has decreased considerably within recent years. It is also interesting to note that most of the Derbyshire records come from newts of this species present in artificially created dew and fire ponds. These habitats appear to have been extremely important for the continuing existence of the crested newt within this region and a further careful search of these and similar habitats may well increase the number of localities where it is known to be present.

PALMATE NEWT (*T. helveticus*)

Contrary to earlier reports this species is present in suitable localities in at least six of the grid squares under review (the Stocksbridge (SK.2/9), Ecclesfield, Sheffield (SK.3/8), Beighton, Baslow, and Hathersage (SK.2/8) squares) and there is little doubt that further searches will reveal its presence within, if not all, at least the majority of the other fourteen 10 km. squares from which there are at present no records.

SMOOTH NEWT (*T. vulgaris*)

The common or smooth newt is present in at least eight grid squares and as with the previous species there is little doubt, particularly if earlier records are considered, that it is present in other localities within the area. It has so far been recorded within the Stocksbridge, Ecclesfield, Sheffield, Beighton, Baslow, Clay Cross (SK.3/6), Bakewell and Hartington 10 km. squares. Its present distribution is perhaps more an indication of the distribution of recorders rather than an indication of its presence or absence within the area.

COMMON TOAD (*Bufo bufo*)

Reports of this species have been somewhat low over the survey period. It has been definitely established as being present within ten of the twenty squares (the Stocksbridge, Sheffield, Ecclesfield, Hathersage, Beighton, Clay Cross, Hartington, Baslow, Bakewell and Temple Normanton (SK.4/6) squares.) There is however little doubt, especially if 1967 and 1968 records are considered, that it will eventually be found to occur in most of the other ten squares. However there is also little doubt, particularly if data from certain well recorded localities for the years 1966 to 1970 are compared, that the numbers now appearing in spring are steadily decreasing. This is particularly

evident in certain of the millponds within the city boundary, where at one time many dozens of toads collected to breed but where few or none can now be found. In some cases even where numbers were quite large, few survived the tadpole stage, chiefly as a result of over-exuberant collecting by children. Thus although a considerable amount of further work is necessary before any definite statement is made, the evidence at present available does point to an overall local decline of this species within the region.

COMMON FROG (*Rana temporaria*)

Widespread and, in some localities, fairly abundant throughout the region; the frog has been recorded in all squares other than those of Holmfirth (SE.1/0), Penistone (SE.2/0), Barnsley, Mexborough (SE.4/0) and Derwent (SK.1/9), and there is little reason to suppose that it is not present within the majority, if not all, of these latter squares too.

There is as yet no evidence of local frog populations being affected by usage of pesticides and no deformed or abnormal specimens have been found. There is evidence of a local decline in the breeding populations in certain localities, although this is as yet nowhere near as marked as that of the previous species.

REPTILES

SLOW WORM (*Anguis fragilis*)

The status and distribution of the slow worm within the Sheffield region is still in doubt. During the survey period a number of post-1960 records have been received. This species is now known from sightings in 1969 and 1970 to be definitely present within the Ecclesfield and Hartington grid squares. Specimens were also noted from just outside the area covered by this report in the Crich (SK.3/5) and Dinnington (SK.5/8) squares. If additional information is taken into consideration derived from sightings in the years 1966, 1967 and 1968, this species would also appear to be present within the Sheffield and Baslow squares. In all cases however the status of this most interesting lizard remains somewhat obscure. A great deal of further intensive searching will be necessary before any definite statement can be made.

COMMON LIZARD (*Lacerta vivipara*)

Sightings made during the course of this survey have definitely established the presence of this species within the Mexborough, Stocksbridge, Staveley, Hathersage and Baslow grid squares. Again however, like the previous species, the common lizard is likely to be missed except in intensive searching and reports from previous years suggest it is present in many of the 10 km. squares, particularly those containing large areas of rough grazing i.e. those of Holmfirth, Penistone, Derwent, Castleton (SK.1/8), Tideswell (SK.1/7), Hartington and Bakewell, in the west of the region. Within the City it has, in recent years, been recorded in the botanical gardens and Darnall.

GRASS SNAKE (*Natrix natrix*)

The Ecclesfield, Chesterfield and Staveley 10 km. squares are at present the only ones for which records have been received during the course of the survey period. Again however this species is usually difficult to find and the only records available are those derived from casual encounters. The grass snake is however the more widespread of the two snake species found in the region and records available for 1966, 1967 and 1968 confirm its presence within the additional squares of Barnsley, Mexborough, Sheffield, and Beighton. If all those records extending over four years from 1966-70 are taken into consideration, it may safely be said that the grass snake is to be found fairly commonly in the region, wherever there is damp or marshy vegetation; even within the heavily populated urban areas there are several occurrences of this snake upon record.

ADDER (*Vipera berus*)

Although once fairly common the adder or viper is now much less widespread and would seem to be more or less completely restricted to the heaths and moors of the Derbyshire Peak and the commons and carrs of the Doncaster area. The species has now been definitely established as still being present within the Ecclesfield, Hathersage and Baslow 10 km. squares. There are no recent reports for elsewhere, although records for previous years suggest that the species is very thinly distributed on most of the heaths

in the west of the region. It may also possibly be present in the carrs and areas of marshland in the Dearne valley, although there are no recent reports.

CONCLUSION

In conclusion then, the results of this survey show that of the nine representatives of the British herpetofauna present within the Sheffield region, four species viz. the toad, frog, palmate and smooth newts, are widespread and in some cases quite common. Another two, the common lizard and grass snake, although the number of 1969-70 records is somewhat limited are, if previous years are considered, probably widespread in suitable habitat conditions. The status of the last three representatives is somewhat doubtful. One, the crested newt, seems to be rapidly disappearing from many localities where it was once apparently common; another, the adder, is rather uncommon and is restricted to certain favourable localities where it is probably thinly distributed. The distribution of the last member, the slow worm, is much less obscure than at the beginning of the survey, its status however still remains a mystery. A great deal of further work in the field is needed before both its status and distribution are completely elucidated.

The drawbacks of this paper are obvious; no attempt can be made for several more years to state definitely the status and distribution of the nine species, yet even these results are a step forward in our knowledge of these two interesting vertebrate classes. They have given some indication of their possible status and distribution within the region. Much of the area has been covered as thoroughly as was possible in the time available, by the writer, and where certain localities have not been covered – and this applies particularly to the extreme north and south of the region, reliance has been placed upon either individuals or local natural history societies, to send in any available information. Unfortunately in most cases the latter method has proved a disappointment and certain of the natural history organisations within this area of South Yorkshire appear to take no interest in their local reptiles and amphibians. The results derived from the first two years of the survey have shown exactly where there is a definite lack of information and this can be corrected in later years. They have also shown where, in some cases, there is a serious decline in numbers and again further data will have to be accumulated in later surveys in an attempt both to verify and, more important, to explain the decrease should it continue.

The presence of reptiles and amphibians, like so many animal groups, has been taken too much for granted by too many naturalists for too long, both in this region and elsewhere in Yorkshire and Derbyshire. As their habitats change and disappear so too do they. Now is the time to begin conservation measures and before such measures can be taken information upon the distribution of the species under consideration must be accumulated. Consequently the writer hopes that the survey will perhaps be more fully supported in future years, by members of the natural history societies in the areas concerned. More important is the hope that perhaps this paper will stimulate other members of the Y.N.U. to initiate similar surveys elsewhere in Yorkshire.

ACKNOWLEDGEMENTS

The writer wishes to thank all those members of the Sorby Natural History Society who have supplied information over the past few years. Without their co-operation much of this paper could not have been written. Thanks also to the staff of the Sheffield City Museum for their support and in particular Mr. T. S. Sands (now Editor of *Habitat*, Council for Nature) for his continued encouragement and help throughout his time in Sheffield.

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Herringshaw, D. (1969 in prep.) Report of the Other Vertebrates Recorder – Reptiles and Amphibians. *Sorby Record* 3, no. 2.

APPENDIX 1. Summary of Occurrences per 10 km. Grid Square in 1969-70

Grid Square	Crested newt	Smooth newt	Palmate newt	Toad	Frog	Com. lizard	Slow worm	Grass snake	Adder
Holmfirth (SE.1/0)									
Penistone (SE.2/0)									
Barnsley (SE.3/0)	×								
Mexbo' (SE.4/0)						×			
Derwent (SK.1/9)									
Stocksb. (SK.2/9)		×	×	×	×	×			
Ecclesf'd (SK.3/9)		×	×	×	×		×	×	×
Roth'ham (SK.4/9)					×				
Castleton (SK.1/9)					×				
Hath'sage (SK.2/9)			×	×	×	×			×
Sheffield (SK.3/8)		×	×	×	×				
Beighton (SK.4/8)	×	×	×	×	×				
Tideswell (SK.1/7)					×				
Baslow (SK.2/7)	×	×	×	×	×	×			×
Chest'f'd (SK.3/7)					×			×	
Staveley (SK.4/7)	×				×	×		×	
Hart'ton (SK.1/6)	×	×		×	×		×		
Bakewell (SK.2/6)		×		×	×				
Claycross (SK.3/6)		×		×	×				
T.N'ton (SK.4/6)				×	×				

THE YORKSHIRE NATURALISTS' UNION ONE HUNDRED AND NINTH ANNUAL REPORT

The Hundred and Eighth Annual Meeting was held on 6th December 1969, at Sheffield, by invitation of the Sorby Natural History Society.

The Presidential Address entitled 'Farming and the Flora' was delivered by Miss C. M. Robb, F.L.S.

The Presidency for 1971 has been offered to and accepted by A. J. Wallis, Esq. The Excursions for 1971 will be to:

V.C. 61	Hunmanby for Filey Bay	12th June
V.C. 62	Hovingham	26th June
V.C. 63	Hardcastle Craggs	24th July
V.C. 64	Ingleton, for Kingsdale	29-31st May
V.C. 65	Aysgarth, for Bishopdale	10-11th July

The year 1970 has not been an easy one for the Union. In common with most societies it has had to face the question of rising costs by increasing the annual subscription as well as seeking new printers who could print the Union's publications at a lower charge. Both decisions have met with a certain amount of unpopularity and caused additional work for the Assistant Treasurer and Editor.

The preparation of "The Naturalists' Yorkshire" was completed during the year and publication is expected in the Spring of 1971. The West Riding County Council's Planning Officer invited members to assist in bringing up-to-date the very useful Schedule of Sites of Scientific Interest. More recently the County Planning Officer for the North Riding sought the Union's assistance in connection with threats to places of natural history interest due to afforestation policy.

As part of its Conservation Year activities the Union took space in the Conservation Exhibition which formed part of the Great Yorkshire Show held in Harrogate. The sixth Chislett Memorial Lecture was given by the well known author and broadcaster Dr. Bruce Campbell. The Wharfedale Naturalists' Society acted as hosts for this and those who visited Ilkley were also able to inspect an Exhibition they had prepared for the occasion.

Membership

At the time of writing the membership of the Union comprises one Honorary Life Member, 13 Life Members, 566 Ordinary Members, 53 Associates and 43 Affiliated Societies.

Deaths

We record with regret the death of the following members: James Fisher and Lord Middleton.

Resignations

D. Barker, B. J. Barton, D. G. Bell, J. E. Blakeway, J. G. R. Broadhead, W. A. Butterfield, S. P. Clark, J. R. Coley-Smith, C. Critchlow, F. H. Cozens, G. E. Dobbs, K. Dugmore, J. R. Farndon, K. V. Foster, J. A. Gillegan, Miss C. Gillies, E. D. Ginz, Mrs. R. Gouldsmith, F. D. Green, T. Gunton, J. Hamilton, F. Hawkin, Miss J. E. Harrison, M. Hemingway, F. Horner, C. E. King, A. E. Land, J. C. Leedal, D. W. Mackie, C. Massingham, R. W. Matthewman, P. J. Mawby, Miss J. Miller, Mrs. J. Mitchell, Mrs. E. Pyrah, A. Riley, F. J. Roberts, W. Roberts, W. R. Scholes, Miss D. Sharrock, R. Shoesmith, C. C. Smith, Miss B. H. Smith, M. Spray, D. Standing, E. S. Stinton, W. Stoney, J. B. Sugden, D. J. Tennant, Miss P. Watson, A. E. Winter, Miss J. Wood.

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MAMMALS, REPTILES, AMPHIBIANS AND FISHES

C. SIMMS

This has been a year of discovery and development in the field and of regrettable secretarial mishandling at indoor meetings; there are real hopes now for a firmer basis of recording, better organisation of the section, and publicity. After a very successful Harrogate joint meeting in March, with contributions by active workers and the beginning of a critical re-appraisal of the function and structure of the section, the Leeds October meeting elected a new team. The section will institute separate sectional meetings, including field-meetings in little-known districts, and encourage both systematic work at Union field meetings and liaison with other working groups in the county.

The most important development in recording has been the establishment of a Yorkshire Mammal Group based in York, to be affiliated to the Union and already undertaking long-term field studies. Its records are to be offered for publication in *The Naturalist* and are not treated here; nor are those of Union Field Meetings and embodied in the paper by T. M. Clegg (*Nat.* 1970, 1-4) already published. Local and national use of our records, especially as 10 km. grid-square abstracts, has increased but has in no case infringed confidences placed with this recorder. Selected records since 1965 have gone to the Mammal Society's Mapping Scheme, and others will go to the Biological Records Centre.

The continued activity of occasional field groups and the persistent work of several individuals has resulted in very useful crops of grid-referenced lower vertebrate records, confirmed the presence of Sand Lizard and established the wild breeding of Pine Marten and Sika Deer, and continued road mortality studies and recording of marine fishes — although the latter are not reported here. The amount of reliable reporting generally continues to grow, and consideration has to be given now to the convenient storage of records, but the proportion from non-Union sources and the extreme patchiness of

cover emphasise how little recording is really being done. In addition to reporters listed in the last two summaries (*Nat.*, 1969, 7-8 and 1970, 17-20), there have been valuable contributions from C. Howes (Doncaster), Mrs. J. Russell (Huddersfield), F. Thompson (Scarborough) and D. W. Yalden (south-west Pennines). All those previous reporters have communicated except those no longer working the county (M. Buckler, B. Gallagher, Miss I. Lester and W. G. Teagle) and Messrs. D. Herringshaw, J. H. Rushton and W. Sanderson.

MAMMALIA

The live-trapping programmes of the Yorkshire Mammal Group are beginning to yield interesting distributional records. The Group has carried out intensive periodic work at a variety of Vale of York localities.

The insectivores have been very little worked this year, but there are many shrew records from owl pellets which need processing, and F. Thompson describes an interesting reported record of a dog's hunting for them. Mole and Hedgehog reports are fewer than usual. Bats are little recorded, but Mrs. Bell reports *Pipistrelle* from Guisborough and C. I. Massey from Scarborough, a roost of up to 67 at East Ayton and Scalby. Whiskered Bats have bred at Skelton (M.J.A.T.), and the Knaresborough Ringing Station group netted Daubenton's Bat in July and also report *Noctules* (K.R.S. Report).

Carnivores continue to receive better attention, but our knowledge of the distribution even of the commoner species is thin. Foxes continue to be noticed in the built-up areas. The Pine Marten has bred at two south-western localities, with at least five young reared, and has recently been located at two places in the north-east (C.S.). Against this at least two have been killed in the south-west (C.S. & Mrs. J.R.). Stoat and Weasel have been seen taking bread bait for bird live-traps (K.R.S. Report). The feral Ferret has been reported more often than usual; from such places as Catterick, Marston Moor (a live specimen collected), Richmond, Dodworth and near Leeds — the last reported as 'a marten' (C.S.). American Mink have been seen only infrequently, but there are indications of their presence along north-eastern streams including the Rye and the Esk, as well as more generally in the Pennines (C.S.). Badgers have continued to be the subject of intensive survey; their distribution by vice-county is in the hands of recorders. The general picture is encouraging, despite repeated examples of illegal gassing, the persistent use of poisoned eggs at some estates and the toll of the road. The Otter has been little noticed this year; observers are alerted for the Universities' Federation for Animal Welfare survey about to be started.

Pinnipeds have continued to be noted by the coastal watchers. Grey Seals seen to run far up the Humber at times, and F.J.T. *et al.* noted a Common Seal feeding off a Lump sucker fish at Filey Brigg.

Ungulates have a considerable following but few reporters; not many observers within the Union work them and few are ready to pass on summary information. Of material to hand, the more significant notes are of Roe and Sika. The former are now considered so well established in some north-eastern localities that they are appearing with increasing frequency in the Vale of York (per M.J.A.T.), and F.J.T. sent notes on Roe in the forests north of the Vale of Pickering. Sika have bred in the south-west and broken out of a Vale of York park when the boundary wall was breached for road-building (Mrs. J.R. and C.S.).

Lagomorphs are better recorded than for several years; especially the Rabbit in the Scarborough area (C.I.M. and F.J.T.) and the Varying Hare in the south-western moorlands, where D.Y. is the first observer to have reported it to the section for several years. Rodents are at last being worked systematically and over the next few years we should see a picture of their grid-square distribution being filled out. Red Squirrels have been seen at Cawthorne (Mrs. J.R. and the late J. Radley) and near Hebden (C.S.); also at several already-known sites in the north-western dales (M.J.A.T.) and the Holderness parks (various observers). The Grey Squirrel is considered uncommon over many afforested areas (C.S. *et al.*) but we need up-to-date information on its status generally. Unconfirmed reports of Dormouse near Leeds and Black Rat near Middlesbrough are being held over and the Yorkshire Mammal Group's reports on mice and voles are eagerly awaited. The Water Vole continues to evade notice successfully.

Cetaceans are recorded by few, and somewhat loosely; a paper summarising recent reports is in preparation.

Alien Mammals are likely to become an increasing feature of this report. By kind co-operation of the Hancock Museum, Newcastle-upon-Tyne, a Coati (*Nasua narica*) — one of two reported during the past two years — from near Osmotherley is now on display at the Yorkshire Museum (1970z48) but there have been no less than seven well-attested occurrences of Raccoons (*Procyon lotor* L.) in the Vales of Pickering and York over the same period. Four of these have been examined shot. They seem quite able to live ferally; presumably escapes.

REPTILIA

There has been less recording of reptiles in the county over the past year and many reports tend to confirm others' observations. Of problems carried over from previous seasons the Tessellated Snake question has not been resolved, nor has any work been reported from the Wolds, but time has been spent on Sand Lizard reports in V.C. 61 and 62. Most of this year's detailed records are from the Doncaster district as a result of excellent work organised by the Museum staff there during Conservation Year. Nearly all other records are from the east, predominantly from the Scarborough district.

Lizards, this year, have included 'alien' Ruin Lizard (*Lacerta sicula*) from near Malton, Grass Snake or Scheltopusik (*Ophisaurus apodus*) near Huddersfield and probably-escaped Slow Worms from Hull and Beverley (C.S.). The presence of the Sand Lizard at Spurn has been confirmed late in the season (C.S.). It is important that the status of this species there be established quickly; but there can only be a small population. Close-up colour slides can soon be checked, and any lizard corpses found there, in whatever condition, would be gratefully received and examined. The introductions of this species in the Doncaster area over twenty years ago are almost certainly extinct now (C.H. *et al.*, C.S.). There are a few new stations for Common Lizard this year: Muston and Newtondale (C.I.M.); Boltby and Bagby (C.S.); Cawthorne and Broomhead (J.R.). The paucity of Slow Worm records and their restriction to V.C. 62 (Dalby, Langdale, Scarborough areas) may reflect merely the industry of Mr. Massey, but "good" areas elsewhere seem to be showing very few recently.

Snakes have had a good season and for once the section is clear of reports of aliens in anything other than very urban districts. The Grass Snake was reported from about a dozen localities around Doncaster during the survey there; some of the localities being "new". The Viper has been reported from Bridestones and Ellerburn nature reserves (C.I.M.), Saddleworth Moor and three Cleveland "slacks" (C.S.). Perhaps partly as a result of fieldwork on this species, warning notices have gone up at Strensall and near Helmsley, and others have been seen near Pickering and Pateley Bridge. Data on breeding collected over the past few years suggests that North York Moors vipers may breed only every other year, but this awaits confirmation.

AMPHIBIA

With useful records only from the Scarborough and Doncaster districts, there is little to note here for the county as a whole.

The Doncaster survey has provided very valuable old records which put the present day situation there, so far as it is known, in perspective. This is particularly true of the newts. Several observers speak of "decline", but from what? C.I.M. has useful records from the Wolds crest; both districts have lists of grid references. About York the marl-pits seem to have very few newts. The status of Palmate Newts in the upland/lowland borders and west of Doncaster, needs investigation; there is useful information for anyone who would take it up.

Frogs and toads provoke again the subject of decline, one or two reporters suggesting a cycle of abundance. The road mortality of Common Toads continues to be noticed, for example 81 outside Staxton one day (C.I.M.) is not an unprecedented extreme. The same observer reports seventeen frogspawn sites in his district; valuable and precise information to base future work on. The Edible Frog introductions near Thorne and the Natterjack releases near Finningley (1949) are not considered to have survived (C.H. *et al.*).

FISHES

These notes briefly summarise 1969 and 1970 freshwater records; we anticipate further accounts of the marine fishes from D. Whittaker. Here only a few items are mentioned from the voluminous notes extracted from the angling press and elsewhere

by C.I.M. and from the Doncaster area survey (per C.H.). It would be a difficult but worthwhile project to document and check the alterations in distribution resulting from anglers' introductions of game and bait fish, and from "improvements" to waterways. From material to hand and verbal reports it seems likely that the Burbot may be rather better established in the Derwent than has been supposed and there is data from C.H. on that other rarity the Barbel in the Idle. The Grayling has been taken from the Costa below Pickering in 1970 (per C.I.M.). Notable specimens have included Brown Trout (15 lb., Driffield) and Silver Bream (2 lb. 10½ oz., Hull). The excellent historical notes assembled by C.H. include much material relevant to a study of the effects of pollution on rivers in the Doncaster district.

ORNITHOLOGY

(R. F. Dickens): The Section has held meetings jointly with the Fishes, Amphibians, Reptiles and Mammals Section in March and October. The March meeting, held in Harrogate, was especially enjoyable and successful and a credit to the local members who arranged it. In October, the Leeds meeting had before it plans for a re-organisation of its various committees and procedures which it is hoped will make for a more expeditious conduct in the future of the very necessary business of the autumn meeting. During 1970, the General Committee, Protection of Birds Act Committee, Spurn Bird Observatory Committee, and Reports Committee have each met on several occasions and the report of the Protection of Birds Act Committee, which appears elsewhere in this issue gives some indication of the time, travelling and energy expended by members and officials of the committees in behind-the-scenes work.

Regrettably the Reports Committee has not yet been able to produce the reports for 1967, 1968 and 1969 when preparation of that for 1970 should already be under way. Despite this lapse, will all members and societies please forward records for 1970 to the appropriate recorder without delay? May we also appeal for batches of 1971 records to be sent in periodically throughout the year in order to spread the load. The recorders will remain the same except that R. J. Rhodes, of 11 Langdale Drive, Scawthorpe, Nr. Doncaster is now the recorder for V.C. 63 (the West Riding south of the Aire).

An additional Ornithological Section Meeting was arranged in Ilkley on the afternoon of the Chislett Memorial Lecture, the Chair being taken by Mr. P. J. Stead. E. S. Skinner of Ilkley spoke on "The B.T.O. Atlas Scheme"; D. Burn of Leeds on "Wildfowl Identification"; J. R. Mather of Knaresborough on "The Development of Nestling Starlings"; R. D. Mitchell of Doncaster on "Birds of Thorne Moors"; and Dr. J. E. S. Walker of Hornsea on "Hornsea Reed- and Sedge-Warblers".

It was a great misfortune for the section that Jeremy Roberts had to relinquish the post of secretary after so short but promising a tenure of the office. We wish him well in his expeditions overseas and look forward to a safe return and a resumption of his duties when he gets back to Britain. In the meantime, I have picked up the reins handed over in 1967 and am temporarily filling the post as acting secretary.

CHISLETT MEMORIAL LECTURE

The Sixth Chislett Memorial Lecture was given by Dr. Bruce Campbell, the well-known author and broadcaster, at Ilkley on 19th September. Hosts for the occasion were the Wharfedale Naturalists' Society who had made provisions for an Ornithological Section Meeting during the afternoon, for tea and refreshments and for an exhibition in the Winter Gardens, next door to the King's Hall. Here Dr. Campbell took as his subject "The Changing Pattern of Scottish Bird Life".

CONCHOLOGY

(E. Dearing): The section has experienced a successful year having held four indoor meetings in City Museum Leeds by kind permission of the Director and field meetings at Kirkby Moorside in May, Bolton-by-Bowland in September and Naburn in October. Attendance at indoor meetings has averaged fourteen and on excursions eight members and friends. The section has been represented at all the Y.N.U. field meetings and reports on these and the indoor meetings have already been published.

Mr. A. Norris, the Recorder, reports that the 10 kilometre recording scheme is now producing results; 18 squares in Yorkshire have now a total of 60 or more species and another 39 squares have over 40. These results are most encouraging considering the small number of active members and the large size of the county.

The following species were taken on the occasions of the field meetings:

1. Kirkby Moorside and Kirkdale area, 2nd May
2. Bolton-by-Bowland, 12th September
3. Hellifield, 12th September
4. Slaidburn, 12th September
5. Naburn Locks, 10th October

Nomenclature according to the 1951 Census of Mollusca of the Conchological Society of Great Britain and Ireland.

Valvata cristata Müller, 5.
V. piscinalis (Müller), 5.
Potamophrgus jenkinsi (Smith), 1,2,3,4.
Bithynia tentaculata (L.), 5.
Carychium minimum (Müller), 1,3,5.
C. tridentatum (Risso), 1,3,4,5.
Lymnaea truncatula (Müller), 3,4.
L. paulstris (Müller), 3.
L. peregra (Müller), 1,3,5.
Aplexa hypnorum (L.), 3.
Physa fontinalis (L.), 1.
Planorbis leucostoma Millet, 3.
P. albus Müller, 3.
P. contortus (L.), 1.
Ancylus fluviatilis Müller, 1,2,3,4,5.
Succinea putris (L.), 5.
S. pfeifferi Rossmassler, 13.
Azeca goodalli (Ferussac), 1.
Cochlicopa lubrica (Müller), 1,2,3,4,5.
C. lubricella (Stabile), 1.
Pyramidula rupestris (Drap.), 3,4.
Columella edentula (Drap.), 1.
Lauria cylindracea (da Costa), 1,2,3,4.
Acanthinula aculeata (Müller), 1,3.
Vallonia costata (Müller), 1.
V. pulchella (Müller), 5.
V. excentrica Sterki, 1,3,5.
Ena obscura (Müller), 1.
Marpessa laminata (Mont.), 1.
Clausilia bidentata (Strom), 1,2,3,4.
Balea perversa (L.), 2,4.
Helicigona lapicida (L.), 3.
Arianta arbustorum (L.), 1,3,4.
Helix hortensis (Müller), 1,3,5.
H. nemoralis (L.), 1,3,4,5.
Hygromia striolata (C. Pfeiffer), 1,2,3,4,5.
H. hispida (L.), 1,2,3,4,5.

Monacha granulata (Alder), 2, 3.
M. cantiana (Montagu), 1.
Helicella caperata (Montagu), 1.
Punctum pygmaeum (Drap.), 1.
Discus rotundatus (Müller), 1,2,3,4,5.
Arion intermedius Normand, 1,3,5.
A. circumscriptus Johnston, 1,3,4,5.
A. fasciatus (Nilsson), 1,2,3.
A. hortensis Ferussac, 1,2,3,4.
A. subfuscus (Drap.), 1,3,5.
A. ater agg., 1,2,3,4,5.
Euconulus fulvus (Müller), 1,2,3,4,5.
Vitrea crystallina (Müller), 1,2,3,4,5.
V. contracta (Westerlund), 1.
Oxychilus cellarius (Müller), 1,2,3,4,5.
O. allarius (Miller), 1,2,3,4,5.
O. helveticus (Blum), 3.
Retinella radiatula (Alder), 2,3,5.
R. pura (Alder), 1,4.
R. nitidula (Drap.), 1,2,3,4,5.
Zonitoides nitidus (Müller), 1,5.
Vitrina pellucida (Müller), 1,2,3,4,5.
Milax budapestensis (Hazay), 2, 4.
Limax maximus L., 2,4.
Lehmannia marginata (Müller), 1.
Agrolimaz reticulatus Müller, 1,2,3,4,5.
A. laevis (Müller), 1,2,3,4.
Sphaerium corneum (L.), 5.
Pisidium amnicum (Müller), 5.
P. casertanum (Poli), 1,3,5.
P. personatum Malm, 1,3,4.

ENTOMOLOGY

A useful year was reported by all recorders and again some interesting insects have been taken in Yorkshire. Amongst the Lepidoptera, Coleoptera and Diptera, particularly interesting species have been recorded. Two welcome additional reports appear this years from Messrs. T. F. Medd (Plant Galls) and C. A. Howes (Arachnida). We look forward to renewed activity in these fields in the years to come.

It has unfortunately been necessary to omit some reports which had not been submitted in time for inclusion in the January issue.

Coleoptera (E. W. Aubrook): The records of Coleoptera which have been submitted have, for a variety of reasons, been less numerous than usual and the following list is, accordingly, shorter than for some years. Two notable discoveries have been made; *Hydroporus bilineatus* Stm. appears not to have been known previously north of King's Lynn, Norfolk, and *Triplax scutellaris* Charp. v. *gyllenhali* Crotch has only been recorded once (Middlewood, Cheshire, 1949) since Bagnall found the species in "thirty localities in Gibside and Hollinside" (Durham) in 1906.

I am grateful for records to Messrs. J. D. H. Flint, J. H. Flint, F. Hawkin and P. Skidmore.

In the following list four species are new to the county and 16 are new vice-county records.

- Hygrobia hermanni* F. (63) Blaxton Common, 5/70; S. Bowstead.
 †*Hydroporus bilineatus* Stm. (61) Cherry Cob Sands, 29/3/70; J.D.H.F.
 **Rantus pulverosus* Steph. (61) Kelsey Hill gravel pits, 28/3/70; J.D.H.F.
 **Nargus wilkini* Spence (63) Farnley Tyas, 4/70; E.W.A. 2nd record for V.C. 63.
Eutheia scydmaenoides Steph. (62) Harton, 5/69, in rotting turnips; E.W.A. Third record for Yorks.
 **Pteryx suturalis* Heer (65) Richmond, 6/9/70; E.W.A.
 **Megarthus depressus* Payk. (65) Richmond, 6/9/70; J.H.F.
 **Nudobius lentus* Grav. (63) Newmillerdam, 3/5/70; F.H.
 **Leptusa fumida* Er. (63) Farnley Tyas, 7/6/69; E.W.A.
 †*Atheta clancula* Er. (64) Askham Bog, 14/5/69; E.W.A.
 **Atheta nigricornis* Thoms. (64) Healaugh, 11/9/68; E.W.A.
 **Atheta oblongiuscula* Sharp (63) Farnley Tyas, 16/4/70; E.W.A.
 **Ocalea badia* Er. (64) Tadcaster, 9/10/69; E.W.A. Second Yorks. record.
 **Aleochara lanuginosa* Grav. (63) Grange Moor, Huddersfield, 21/4/66; E.W.A.
 †*Aleochara fumata* Grav. (63) Newmillerdam, 15/7/66; E.W.A.
 **Platycis minuta* F. (64) Bramham Park, 5/9/70; J.H.F. Only previous Yorks. records in V.C. 62.
Lampyris noctiluca L. (64) Stutton, 17/6/68; J. E. Jenkinson: (65) Leighton Res. Nr. Masham, 11/7/70; D. Cundall.
Silis ruficollis F. (63) Shirley Pool, Askern, 27/6/70; P.S. Only recorded from this locality in Yorkshire.
 †*Triplax scutellaris* Charp. v. *gyllenhali* Crotch (62) Arncliffe Woods, Egton, 17/9/70 on *Pleurotus*; E.W.A. The third British locality.
 **Scymnus auritus* Thumb. (63) Hatfield Chase, 15/6/69; E.W.A.
 **Cartodera filum* Aub. (63) Huddersfield, 18/3/70, in house; E.W.A. Second record for Yorks.
Melandrya caraboides L. (64) Hetchell Crag Nat. Res., 9/6/70; J.H.F.
 **Donacia clavipes* F. (63) Thorne Moors, 7/6/70, in *Juncus* bog; P.S.
Clytra quadripunctata L. (62) Hackness, 6/70; E.W.A.
 **Apion cruentatum* Walt. (65) Richmond, 6/9/70; E.W.A.
Phloeophagia spadix Hbst. (61) Spurn, 8/7/70; F.H.
 **Rhyncolus lignarius* Marsh. (64) Fairburn Ings Nat. Res., 28/10/69; J.D.H.F.
 **Gymnetron antirrhini* Payk. (61) Kiplingcotes Quarry, 1/9/70; J.H.F.
Xyleborus saxeseni Ratz. (63) Newmillerdam, 3/5/70; F.H.

Diptera (P. Skidmore): Another rather sparse year for Diptera records, due to the fact that dipterists have been occupied in other, more mundane matters, domestic and conservational. Again Thorne Moors figures in the records and it was very gratifying to witness the abundance of insect life there after the great fire which swept almost the entire moor during the last week of June; it evidently had little effect on the Large Heath butterfly and such dipterous specialities as the Scatophagid *Pogonota hircus* Zett. (see Annual Report for 1969; *Nat.*, 1970, 25). This latter species was in great abundance over a wide area of the moor during early July. During June two visits were made to Shirley Pool by the writer and it was pleasant to see several of the very local flies recorded there on the Y.N.U. visit in 1938 (e.g. *Cordylura ciliata* and *C. impudica*, etc.). In the present list there are 22 new vice-county records and 2 new county records.

- **Tabanus bimaculatus bimaculatus* Mg. (*bisignatus* Jaen.) (63) Fairly common on Thorne Moors on 7/6/70; P.S.
 **T. montanus* Mg. (63) This was in numbers on the edge of Thorne Moors near the colliery tip on 21/6/70, the day the fire started, and again, more widely on 5/8/70; P.S., H. Beaumont.
 **Nemotelus uliginosus* (L.) (63) Owston, one on *Heracleum* flower near fishponds, on 27/6/70; P.S. Only one previous Yorkshire record, Spurn (*Nat.*, 1919, 388).
 **Rhamphomyia barbata* Mg. (63) Went Valley, rough pastures by river near the New Junction Canal, 18/6/70; P.S. Previous Yorkshire records are from Colburn Beck (V.C. 65) and Askham Bog (V.C. 64).
 **Syrphus albostrigatus* Fallén (65) Richmond, 6/9/70; R.C.

- ***S. labiatarum* Verrall (61) Houghton Wood, 11/8/70; R.C. (65) Richmond, 6/9/70; R.C.
- **Platycheirus discimanus* Loew. (63) Haw Park, 5/69; several males, one female; R.C.
- **Helophilus transfugus* (L.) (61) Brough, 27/5/70; R.C.
- **Criorhina berberina* (F.) (61) Houghton Wood, 26/5/70; one specimen only; R.C.
- **C. floccosa* Mg. (61) Houghton Wood, 20/6/70, one only; R.C.
- **Enicita annulipes* Mg. (63) Candy Pumping station, River Torne, 14/6/70 and Went Valley, by the New Junction canal, 18/6/70; P.S. Abundant on decaying water plants in both places.
- **Pherbellia scutellaris* Fallén (65) Richmond, 6/9/70; R.C.
- **Ctenulus distinctus* Mg. (63) Went Valley, damp ditch by the New Junction Canal, 18/6/70; P.S. Only previous record — Hotham Carr (K. G. Payne, *Naturalist*, 1954, 18).
- †*Renocera fuscinervis* (Zett.) (63) Went Valley, damp ditch by the New Junction Canal 18/6/70; P.S. A northern species, more characteristic of upland areas, known from Lancashire, Cheshire, Derbyshire and Westmorland.
- **Sepedon sphegeus* (F.) (63) West Ings, near Stainforth, several by evening sweeping over *Eleocharis* by dike, 26/8/70; J. Burn. A good record, the second for Yorkshire, the other being from Pilmoor (*Naturalist*, 1919, 395).
- **Cordylura pubera* (L.) (63) Went Valley, pair swept from *Carex riparia* growing in dike by New Junction Canal, 18/6/70; P.S. *Cordylura* species are strikingly local in Yorkshire; they are associated with *Cyperaceae*.
- NB—*C. impudica* was numerous amongst *Carex acutiformis* at Rushy Moor on 20/6/70 and at nearby Shirley Pool on 27/6/70, while *C. ciliata* Mg. abounded on the same plant which grew in a large bed in a damp woodland near Owston (grid ref. SE 558101) on 27/6/70; P.S. Both were recorded by W. D. Hincks on the Y.N.U. visit to Shirley Pool on 25/6/38 (*Naturalist*, 1938, 288).
- **Myocera carinifrons* (Fallén) (65) Castle Bank, Wensleydale, 26/8/69; M. T. Brook. Only second Yorkshire record, first being from Pateley Bridge (C. A. Cheetham); a widely scattered parasite of *Scarabaeidae*.
- **Protocalliphora sordida* Zett. (62) Strensall, 17/7/69; M. T. Brook. Only previous Yorkshire records from Potteric Carr (V.C. 63) where it is frequent, and Spurn (V.C. 61).
- **Onesia agilis* (Mg.) (63) Bretton, 19/8/65; M. T. Brook; a case of a very common species which has been inadvertently missed by recorders (just as there are few records on the cards for the House fly—*Musca domestica*).
- **Morella aenescens* R.-D. (62) Strensall, 17/7/69; M. T. Brook.
- **Dasyphora cyanicolor* Zett. (63) West Burton, Wensleydale, 24/8/69; M. T. Brook.
- **Helina denudata* (Zett.) (63) Hepworth, 15/6/69; M. T. Brook. A nice record, only second for Yorkshire, the first being taken at Allerthorpe by W. J. Fordham and presented to J. E. Collin. This is a northern species found mainly in hilly or mountainous areas, especially in the Highlands.
- †*Ornithomyia biloba* Duf. (61) Spurn, 1 ♂ 25/5/70, ex swallow; J. W. Hartley. Mr. H. Beaumont, to whom the specimen was given had it confirmed at the British Museum. Apparently there is only one earlier authentic British record of this fly (Herefordshire, 1964).

Lepidoptera (S. M. Jackson)

Following a fairly good spring and warm summer, the past season may be regarded as having been quite good for our resident insects. With one or two exceptions, however, the migrants, especially among the butterflies, have been rather sparse. There have been no northern records for the Clouded Yellow, which has also been scarce in the south. Among the moths things have been rather better and I am happy to say two species have been added to the county list. The number of contributors is up on last year, records having been received from the following, from which I have extracted the more important.

A. Charman, W. E. Collinson, D. B. Cutts, F. C. Draper, J. H. Flint, T. Ford, K. Garsed, C. R. Haxby, A. M. R. Heron, J. Hunt, W. Jagger, J. C. Lavin, J. D. Pickup, A. C. Pullan, C. I. Rutherford, P. Skidmore, S. L. Sutton, P. G. Tannett, P. Winter.

My thanks are due to the above and also to Mr. B. Spence, warden at Spurn, for information received through S.L.S. on many important captures.

- Euchloe cardamines* L. (Orange Tip) Appears to have been more widespread than usual. J.D.P. reports "never known it so common in Pontefract district".
- Gonepteryx rhamni* L. (Brimstone) (63) Armthorpe and Potteric Carr; J. Burn (P.S.).
- Argynnis aglaia* L. (Dark Green Fritillary) (62) Shows no sign of extending its range but still common in a few localities in the north-east. Newton Dale, very common, 4/8/70; Raindale, 6/8/70; Ellerburn, common, 6/8/70; P.W.
- Argynnis euphrosyne* L. (Pearl-Bordered Fritillary) (62) Several, Raindale and adjacent forest, 6/6/70; S.M.J.
- Argynnis selenae* Schiff. (Small Pearl-Bordered Fritillary) (61) Not reported from Skipwith since 1967. (64) No recent visits having been made to the isolated Austwick Moss locality, C.I.R. made a special survey, 14/6/70 and I am pleased to say the insect was still found to be common there.
- Nymphalis io* L. (Peacock) Another good year. Numerous records received from all over the county and particularly common in the south-east.
- Vanessa cardui* L. (Painted Lady) Not really common as last year but fairly widely reported and certainly more numerous than the following insect.
- Vanessa atalanta* L. (Red Admiral) Only a few records received for this species, which evidently had rather a poor year.
- Melanargia galathea* L. (Marbled White) (62) Burdale, 18/7/70; S.M.J. Fair numbers seen on a dull day. The species is no doubt holding its own in the county.
- Pararge aegeria* L. (Speckled Wood) None recorded for some years in former localities round Selby. Noted in some numbers however near (64) Fairburn; J.H.F. Also in same area at Ledsham and (63) Brocadale plentifully; J.D.P.
- Lycaena phlaeas* L. (Small Copper) Widely reported from all over the county.
- Erynnis tages* L. (Dingy Skipper) Rather common and reported from several localities where it has not previously been noted.
- Mimas tiliae* L. (Lime Hawk) (63) Goole, 6/70; (J.H.). Recorded previously only from Doncaster area.
- Acherontia atropos* L. (Death's Head Hawk) (62) The only records I have are of two reported from the Whitby district (dates unspecified); P.W.
- Herse convolvuli* L. (Convolvulus Hawk) Several singles as follows: (63) Cusworth, Doncaster, 10/70; G. Stewart (P.S.); Wakefield, 11/10; A.M.R.H. (64) Knaresborough; S.L.S. Otley, 30/9/70; J. Oxtoby (C.R.H.).
- Macroglossum stellatarum* L. (Humming-Bird Hawk) (62) One record only, Snainton, Scarborough; P. Ingham (P.W.).
- Cerura furcula* L. (Sallow Kitten) (61) Barlby, 21/8/70; S.M.J. A late date and possibly a second brood. Skipwith, one larva, 20/9/70; T.F. (63) Birkenshaw, Bradford, 6/7/70; W.J. Rather scarce in industrial areas.
- Drymonia ruficornis* Hufn. (Lunar Marbled-Brown) (62) One full grown larva Silpho, Scarborough, 11/7/70; S.M.J. (64) Hetchell Woods; J.H.F. and S.L.S.
- Tethea ocellaris* L. (Figure of Eighty) (64) One at sugar on poplar trunk in my own garden in Selby is the only record, 28/6/70; S.M.J.
- Leucoma salicis* L. (White Satin) (63) Tunnelpits, 14/6/70, many larvae on grey poplar; J. Burn (P.S.). (64) Bishop Wood, 17/7/70, adults; W.J.
- Eriogaster lanestris* L. (Small Eggar) (62) Nest of larvae on hawthorn hedge near Ampleforth, 20/6/70; S.M.J.
- Bena prasinana* L. (Green Silver-Lines) (62) Sutton Bank; S.L.S. (63) Birkenshaw, Bradford, 9/6/70; W.J. Elland, 19/6/70; A.C.P.
- Diacrisia sannio* L. (Clouded Buff) (61) Skipwith, 20/6/70; W.J. (62) Strensall; S.L.S. Rather scarce generally apart from the above two well-known habitats.
- †*Lithosia quadra* L. (Large Footman) (64) Skipton, 29/7/70; J.C.L. It is significant that three light traps, combined, and operating in different parts of the Arncliffe-Milnthorpe area of south Westmorland, took no less than ten of this species. The present record, which is the first for Yorkshire, was clearly one of a considerable movement which occurred at that time. It is unusual for such to penetrate so far north.
- Colocasia coryli* L. (Nut-Tree Tussock) (64) Shadwell, Leeds; S.L.S.
- Apatele alni* L. (Alder) (63) Allerton, Bradford, 8/6/70; A.C. Very scarce in S.W. Yorks.
- †*Simyra albovenosa* Goeze (Powdered Dagger) (61) Spurn; S.L.S. The first Yorks. record and a highlight of the year. The location of capture is exactly similar to this insect's usual more southerly coastal habitats and it seems not unlikely the species has had an established small colony here for a long time.
- Agrotis ripae* Hubn. (Sand Dart) (61) Still frequent at Spurn; S.L.S.

- Amathes castanea* Esp. (Grey Rustic) (64) A few on heather at Brimham Rocks, 29/8/70 (all grey form) a new locality for this rather uncommon species; S.M.J.
- Eurois occulta* L. (Great Brocade) (61) I have a single record only for the year from Spurn, which locality suggests the insect was probably an immigrant; S.L.S.
- Hadena nana* Hufn. (Shears) (63) Halifax; W.E.C. Only the second record for the district. Distinctly uncommon in the industrial areas.
- Hadena lepida* Esp. (Tawny Shears) (61) Skipwith, 30/5/70; S.M.J. and W.J. New to my Skipwith list. Several, Muston, Filey; P.W.
- Dryobotodes protea* Schiff. (Brindled Green) (64) Knaresborough; S.L.S.
- Eremobia ochroleuca* Esp. (Dusky Sallow) (61) Spurn; S.L.S. This is mainly a southern downland insect and the odd records we have (last Sheffield 1955) pose interesting questions.
- Celaena haworthii* Curt. (Haworth's Minor) (64) Shadwell, Leeds; S.L.S. It is very unusual to find this moth so far from its cotton grass/heathland habitat.
- Nonagria dissoluta* Treits. (Brown-Veined Wainscot) (61) Skipwith, 15/8/70; W.J. Previously known here but evidently it is rather uncommon judging by the scanty records.
- Leucania obsoleta* Hubn. (Obscure Wainscot) (61) Muston, Filey, one, 10/6/70; P.W. A very early date and the most northerly record we have. The species appears to be extending its range, as besides being noted in some numbers in its best known locality Skipwith (61) by W.J., it has also occurred this year at Spurn (61) similarly, S.L.S.
- Leucania litoralis* Curt. (Shore Wainscot) For a long period following the 1953 floods this species was not observed at its Spurn (61) stronghold. It has, however, appeared again and has been noted in each of the last 3 years (see also *Nat.*, 1967, p. 20).
- Amphipyra pyramidea* L. (Copper Underwing) (63) Once more recorded from the unlikely and unpromising West Riding industrial belt — Elland, both 1969 and 1970; K.G.
- Zenobia subtusa* Fabr. (Olive) (63) Sheffield, one, 9/9/70; T.F.
- Lithomoia solidaginis* Hubn. (Bilberry Brindle) (64) Brimham Rocks, 29/8/70, on heather and at sugar; S.M.J.
- Cucullia verbasci* L. (Mullein Shark) (63) Goole, 5/70; J.H. This record apparently refers to an adult. The species is more often in the larval stage.
- Cucullia umbratica* L. (Shark) (63) Birkenshaw, Bradford, 7/7/70; W.J. Halifax; W.E.C. Not rare but nearly always reported in singles.
- Abrostola triplasia* L. (Dark Spectacle) (61) Muston, Filey, 22/6/70; P.W. Rather scarce throughout the county.
- Rivula sericealis* Scop. (Straw Dot) (61) Spurn; S.L.S. Not often recorded, but probably overlooked.
- Odezia atrata* L. (Chimney Sweep) (62) Ampleforth, 20/6/70; S.M.J. Sutton Bank, 25/6/70; A.M.R.H. (64) Probably seen this year for the last time on Selby Common following changes in habitat; S.M.J.
- Sterrhia sylvestriaria* Hubn. (Dotted Border Wave) (62) Strensall, 18/6/70; C.I.R. In spite of annual heath fires it is still not uncommon in this locality.
- Chloroclysta miata* L. (Autumn Green Carpet) (61) South Cave, 7/10/69; D.B.C. Not previously recorded so far east.
- Lygris mellinata* Fabr. (Spinach) (63) Birkenshaw, Bradford, 8/7/70; W.J. Appears to be less common than formerly.
- Calocalpe cervinalis* Scop. (Scarce Tissue) (64) Burley-in-Wharfedale; F. C. Draper. The only other recent records are from Harrogate.
- Lampropteryx suffumata* Schiff. (Water Carpet) (61) South Cave, 8/5/69; D.B.C. (64) Ledston Park; A.C.P. Two new localities.
- Larentia clavaria* Haw. (Mallow) (64) Knaresborough; S.L.S. Rather uncommon and local.
- Oporinia autumnata* Borkh. (Autumnal Moth) (64) Scar Gill, Kettlewell, 10/69; P.G.T.
- Epirrhoe rivata* Hubn. (Wood Carpet) (61) Spurn; S.L.S. The first record for very many years and from an unexpected locality.
- Perizoma flavofasciata* Thunb. (Sandy Carpet) (63) Elland, a few; K.G.
- Eupithecia venosata* Fabr. (Netted Pug) (63) Keighley, 10/6/70; J.C.L. Birkenshaw, Bradford, 6/7/70; W.J. Rather local and not very common in above areas.
- Eupithecia albipunctata* Haw. (White Spotted Pug) (62) Gundale, Pickering, 3/7/70; S.M.J. and W.J. (64) Bishop Wood, larvae, 13/10/70; S.M.J.

- Eupithecia trisignaria* H.S. (Triple-Spotted Pug) (64) Bishop Wood, larvae, 13/10/70; S.M.J.
- Eupithecia succenturiata* L. (Bordered Pug) (63) Goole, 7/70; J.H.
- Eupithecia subnotata* Hubn. (Plain Pug) (63) Rotherham, larvae on goosefoot, 13/9/70; T.F. Not often taken in Yorks. and said to be migratory.
- Gymnoscelis pumilata* Hubn. (Double-Striped Pug) (61) Muston, Filey, 6/7/70; P.W. This species, common in the south, was not recorded for many years in Yorks. but there have more recently been several records and I have seen it in my own garden (63) Selby; S.M.J.
- Chloroclystis coronata* (Hubn.) (V Pug) Another of this group which appears to have increased in recent years. Numerous records have been received from many parts of the county.
- Ellopija fasciaria* L. (Barred Red) (61) Spurn; S.L.S. (63) Rotherham, 23/7/70; T.F. Fairly common where pines are well established. I have included the above two records coming from most unlikely localities.
- Biston stratharia* Hufn. (Oak Beauty) (61) Muston, Filey, 15/4/70; P.W. (63) Birkenshaw, Bradford, 15/4/70; W.J. The latter is a remarkable capture and is a new record for the Bradford area.
- Procris statice* L. (Forester) (63) Near Sykehouse, 6/70; J. Hartley (P.S.). (64) Common this year on Selby Common, but this habitat is threatened; S.M.J.
- Aegeria formicaeformis* Esp. (Red-Tipped Clearwing) (63) Thorne, from larvae collected, 14/6/70, adults emerged mid July; J.B. and P.S. The only other record I have for recent years is from York, 1947.
- Zeuzera pyrina* L. (Leopard) (63) Halifax, one at light; W.E.C. Very few Yorks. records in recent years.

Arachnida (C. A. Howes and C. J. Smith): The alarming conservation situation which has developed in South Yorkshire, with Low Ellers, Sandall Beat Nature Reserves and Thorne Moors all being seriously threatened, has necessitated the urgent and thorough surveying of these sites. Arachnid lists have been started for these and several other previously unworked localities near Doncaster and the field work has resulted in the discovery of many rare and interesting species which include nine new vice-county records and one new county record.

Extensive work by Clifford Smith on the spiders of Askham Bog, Skipwith Common and Strensall Common from 1959-62 has contributed substantially to Yorkshire arachnology. Although Mr. Smith's data on the Linyphiid spiders of Askham Bog has been separately published (*Nat.*, 1962, 121-124) the remaining unpublished records are included here.

As the spiders and their allied orders have been neglected for so long in Yorkshire (the last annual review being in 1947, though the continuity of annual reports was broken in 1928 in the days of the old Y.N.U. Arachnida Committee) it is hoped that this report will encourage a revival of interest in this fascinating group. With a view to recontinuing the systematic collecting and documentation of Yorkshire arachnids, a bibliography of notes and papers on Spiders, Harvestspiders, and Pseudoscorpions, published in the *Naturalist* from 1900-1970 has been compiled (copies are available from C. A. Howes, Museum and Art Gallery, Chequer Road, Doncaster). Work has also begun at Doncaster Museum on the compilation of a county card index.

We are grateful for records from Mr. J. Burn, Mr. G. P. Stewart, members of the Thorne Moor Study Group (T.M.S.G.), also Messrs. W. Bunting, W. Bunting Jnr., N. Bunting, C. J. Devlin, B. Lawrence and P. Skidmore. We would like also to express special thanks to Mr. D. W. Mackie for his records and valuable help and advice on identification.

- Ciniflo fenestralis* (Stroem) (62) Strensall Common, July 1959-62; C.J.S. (63) Thorne Moors, Thorne, Doncaster, common in stone walling and old brickwork, 1969-70; C.A.H. (65) Aysgarth, 8/10/70; C.A.H.
- C. similis* Bl. (62) Scarborough m., 26/12/69; C.A.H. (63) Bessacarr, Armthorpe, Low Ellers (Potteric Carr), Doncaster, Thorne, as *C. fenestralis*, 1969-70; C.A.H. Thorne Moors, -/3/70; T.M.S.G.
- C. ferox* (Walk.) (63) Thorne, large specimens collected from old buildings, -/5/70; W.B.
- Dictyna arundinacea* (Linn.) (62) Strensall Common, May 1959-62; C.J.S. (63) Thorne Moors, in dead inflorescences of *Juncus*, *Rubus*, *Hieracium* and *Crepis*, 6/7/70. Low Ellers (Potteric Carr), notably among calcicolous plants along railway

- embankments -/5/70. Denaby Ings, -/5/70; C.A.H. (64) Askham Bog, May-June 1959-62; C.J.S.
- D. uncinata* Thor. (63) Bentley Common, 16/5/70, Denaby Ings, -/5/70, Low Ellers (Potteric Carr), -/5/70 all in deeply fissured bark of old *Salix fragilis*; C.A.H. (64) Askham Bog, July 1959-62; C.J.S.
- Dysdera crocata* C. L. Koch (62) Scarborough, 9/10/70; per C. I. Massey. (63) Bawtry, in a bathroom, -/5/70; C.A.H.
- Harpactes hombergi* (Scopoli) (63) Cusworth Hall, 20/5/70; G.P.S.
- Segestria senoculata* (Linn.) (65) Aysgarth, 8/10/70; C.A.H.
- Drassodes lapidosus* (Walk.) (62) Strensall Common. May-June 1959-62; C.J.S. (63) Thorne Moors, 24/4/69; T.M.S.G.
- Clubiona corticalis* (Walk.) (62) Strensall Common, June 1959-62; C.J.S.
- C. reclusa* O. P. Camb. (64) Askham Bog, May-July 1959-62; C.J.S. (63) Thorne Moors, 24/4/69; P.S. 15/5/69; C.A.H.
- C. stagnatilis* Kulcz. (61) Skipwith Common (62) Strensall Common. (64) Askham Bog, most months, 1959-62; C.J.S.
- C. pallidula* (Clerck) (63) Thorne Moors, 24/4/69, 15/5/69; T.M.S.G.
- C. phragmitis* C. L. Koch (63) Thorne Moors, 24/4/69, 15/5/69; T.M.S.G. (64) Askham Bog, February and July 1959-62; C.J.S.
- C. lutescens* Westr. (63) Haw Park, 30/8/69, D.W.M. Shaw Wood, (Armthorpe), -/6/70, Sandall Beat Wood, -/8/70; C.A.H. (64) Askham Bog, May-June 1959-62; C.J.S.
- C. compta* C. L. Koch (61) Skipwith Common, June 1959-62; C.J.S. (63) Haw Park, 30/8/69; D.W.M.
- C. bivipes* Bl. (62) Strensall Common, June 1959-62. (64) Askham Bog, May 1959-62; C.J.S.
- C. trivialis* C. L. Koch (62) Strensall Common, July 1959-62; C.J.S.
- C. diversa* O. P. Camb. (62) Strensall Common, March and July 1959-62, C.J.S. (63) Haw Park, 30/8/69; D.W.M.
- Zora spinnemana* (Sund.) (62) Strensall Common, February, March and November, 1959-62, C.J.S. (63) Thorne Moors, 24/4/69, 16/6/70; T.M.S.G. (64) Askham Bog, February, March 1959-62; C.J.S.
- Micaria pulicaria* (Sund.) (61) Skipwith Common, June 1959-62. (62) Strensall Common, March 1959-62; C.J.S.
- Xysticus cristatus* (Clerck) (62) Strensall Common, July 1959-62; C.J.S. (63) Very common among low herbage. Thorne Moors, 1969-70. Auckley Common, 19/8/69. Torne Bridge, -/9/70. Low Ellers (Potteric Carr), -/8/70. Levitt Hagg, 27/9/70; C.A.H. Shaw Wood (Armthorpe), -/6/70; J.B. Haw Park, 30/8/69; D.W.M.
- X. audax* (Schrank) (63) Thorne Moors on bare sun-baked peat, 6/6/70; T.M.S.T.
- X. erraticus* (Bl.) (62) Strensall Common, June 1959-62; C.J.S.
- X. lanius* C. L. Koch (64) Askham Bog, May 1959-62; C.J.S.
- X. ulmi* (Hahn) (62) Strensall Common, May 1959-62; C.J.S. (63) Thorne Moors, Crowle (Yorks.) Moors, -/5/69; T.M.S.G. (64) Askham Bog, May and August 1959-62; C.J.S.
- Oxyptila trux* (Bl. (62) Strensall Common, September 1959-62; C.J.S.
- Philodromus aureolus* (Clerck) (62) Strensall Common, June 1959-62; C.J.S.
- P. histrio* (Lat.) (62) Strensall Common, May 1959-62; C.J.S.
- Tibellus maritimus* (Menge) (62) Strensall Common, June 1959-62; C.J.S. (63) Thorne Moors, June-September in *Calluna* and *Eriophorum*; 1969-70. Swept from *Phragmites* 6/6/70; T.M.S.G. (64) Askham Bog, October 1959-62; C.J.S.
- T. oblongus* (Walk.) (62) Strensall Common, May-July 1959-62; C.J.S. (63) Thorne Moors, commonly swept from *Eriophorum*, June-August 1970; T.M.S.G. Went Valley, -/6/70. Low Ellers (Potteric Carr), -/9/70; C.A.H. Cusworth, -/9/70; G.P.S. (64) Askham Bog, September 1959-62; C.J.S.
- Salicinus scenicus* (Clerck) (62) Newby, 26/12/60; C.A.H. (63) Doncaster, many on Museum building, 1969-70; C.J.D. Thorne Moors, 6/6/70. Bentley Common, 16/5/70. Low Ellers (Potteric Carr), -/6/70; C.A.H. Cusworth, -/5/70; G.P.S.
- S. cingulatus* (Panz.) (63) Thorne Moors, common on dead birches, 6/6/70; T.M.S.G. (64) Askham Bog, May-July 1959-62; C.J.S.
- Neon reticulatus* Bl. (64) Askham Bog, July 1959-62; C.J.S.
- Sitticus pubescens* (Fabr.) (63) Thorne Moors, 22/7/69; T.M.S.G.

- Euphrys frontalis* (Walk.) (63) Low Ellers (Potteric Carr), on railway embankment, 24/5/70; C.A.H.
- **E. oequipes* O. P. Camb. (63) Low Ellers (Potteric Carr), in deeply fissured bark of old *Salix fragilis*, 24/5/70; J.B.
- Evarcha falcata* (Clerck) (61) Skipwith Common, 1959-62; C.J.S.
- Lycosa agricola* Thorell (62) Forge Valley, among *Luzula* roots, 26/12/69; C.A.H.
- L. monticola* (Clerck) (63) Thorne Moors, on dry *Calluna*, April-June 1969-70; T.M.S.G.
- L. tarsalis* Thorell (63) Thorne Moors, June-July 1969-70; T.M.S.G.
- L. pullata* (Clerck) (61) Skipwith Common, 1959-62; C.J.S. (62) Strensall Common, May-July 1959-62; C.J.S. (63) Thorne Moors, on bare peat, June-July 1969-70; T.M.S.G.
- L. amenata* (Clerck) (62) Strensall Common, May 1959-62; C.J.S. (63) Thorne Moors, 6/6/70; T.M.S.G. Bentley Common, 16/5/70; C.A.H. (64) Askham Bog, April-September 1959-62; C.J.S.
- L. nigriceps* Thorell (62) Strensall Common, May and July 1959-62; C.J.S. (63) Thorne Moors, in *Pragmites* litter, 6/6/70; T.M.S.G. Sprotborough Ings and Warmsworth Ings, very common, 18/5/69; C.A.H.
- L. lugubris* (Walk.) (62) Strensall Common, June 1959-62; C.J.S. (63) Thorne Moors, in birch areas, June-July 1969-70, T.M.S.G. Haw Park, 30/8/69; D.W.M.
- Tarentula pulverulenta* (Clerck) (61) Skipwith Common, 1959-62; C.J.S.
- T. barbipes* (Sund.) (61) Skipwith Common, -/9/65; Mrs. F. Murphy (B.S.S.G. No. 29) (63) Thorne Moors, -/8/69; T.M.S.G.
- Trochosa ruricola* (Degeer) (64) Askham Bog, May 1969-62; C.J.S.
- T. terricola* Thorell (63) Thorne Moors, 15/5/69, 6/6/70; T.M.S.G. Haw Park, 30/8/69; D.W.M.
- Pirata piraticus* (Clerck) (63) Occurs in abundance on the ings, marshes, and dykes along the rivers Dearne, Don, Torne and Went. 1969-70; C.A.H. Thorne Moors, very common, 1969-70; T.M.S.G. (64) Askham Bog, May-August 1959-62; C.J.S.
- P. hygrophilus* Thorell (61) Skipwith Common, 1959-62 (62) Strensall Common, June-July 1959-62; C.J.S. (63) Thorne Moors in *Sphagnum* filled dykes. July-August 1969-70; T.M.S.G. (64) Askham Bog, May-August 1959-62; C.J.S.
- **P. piscatorius* (Clerck) (63) Thorne Moors, 10/8/69; T.M.S.G. Second County record.
- Pisavra mirabilis* (Clerck) (62) Strensall Common, June 1959-62; C.J.S. (63) A pair collected in Devon were released on the lawns near Doncaster Museum, 2/6/69; C.A.H.
- Argyroneta aquatica* (Clerck) (63) Thorne Moors, numerous in dykes on west edge of moor, 1969-70; T.M.S.G. Haw Park in canal, 30/8/69; D.W.M.
- Agelena labyrinthica* (Clerck) (63) Thorne Moors, -/8/69; T.M.S.G.
- Tegeneria atrica* C. L. Koch (63) Low Ellers (Potteric Carr). Common under debris on railway embankments, 1970. Doncaster, common, coming indoors in the autumn. Specimens with leg span of $3\frac{1}{2}$ " recorded; C.A.H.
- **T. agrestis* (Walk.) (63) Armthorpe, on wall, 25/9/70; J.B. Levitt Hagg quarry, under limestone rubble at the foot of the old quarry face, 27/9/70; C.A.H.
- T. domestica* C. L. Koch (63) Thorne Moors (Colliery Tip), 1969-70; T.M.S.G. Low Ellers (Potteric Carr) under debris on railway embankments, 31/5/70. Doncaster, a very common indoor species; C.A.H.
- T. silvestris* L. Koch (62) Strensall Common, November 1959-62; C.J.S.
- Cryphoea silvicola* C. L. Koch (62) Strensall Common, March 1959-62; C.J.S.
- Amarobius atropos* (Walk.) (63) Levitt Hagg Quarry, 27/9/70; C.A.H. (65) Aysgarth, 8/10/70; C.A.H.
- Antistea elegans* (Bl.) (61) Skipwith Common (62) Strensall Common, July-August (64) Askham Bog, February, July-August 1959-62; C.J.S.
- Hahnia montana* (Bl.) (64) Askham Bog, February 1959-62; C.J.S.
- Ero cambridgei* Kulcz. (62) Strensall Common, February, March, June 1959-62; C.J.S. Newby, in greenhouse, 26/12/69; C.A.H. (64) Askham Bog, November-April 1959-62; C.J.S.
- E. furcata* (Villiers) (64) Askham Bog, December 1959-62; C.J.S.
- Episinus angulatus* (Clerck) (62) Strensall Common, June and November 1959-62; C.J.S.
- Asagena phalerata* (Panz.) (62) Strensall Common, June 1959-62; C.J.S.
- Stetoda bipunctata* (Linn.) (62) Newby, abundant in greenhouse, 26/12/69; C.A.H. (63) Thorne Moors, -/8/69. Sandall Beat Wood, -/6/70; C.A.H. (64) Askham Bog, August 1959-62; C.J.S.

- Theridium sisyprium* (Clerck) (62) Strensall Common May-July. (64) Askham Bog, July-August 1959-62; C.J.S.
- T. impressum* L. Koch (61) Skipwith Common. (64) Askham Bog, September 1959-62; C.J.S.
- T. pictum* (Walk.) (61) Skipwith Common (62) Strensall Common, July. (64) Askham Bog, May 1959-62; C.J.S.
- T. varians* Hahn (61) Skipwith Common, 1959-62; C.J.S.
- T. denticulatum* (Walk.) (61) Skipwith Common. (62) Strensall Common, June 1959-62; C.J.S.
- T. ovatum* (Clerck) (62) Strensall Common, June 1959-62; C.J.S. (63) Thorne Moors, common among Rhododendrons, 1969-70; T.M.S.G. Haw Park, 30/8/69; D.W.M. (64) Askham Bog, July 1959-62; C.J.S.
- T. bimaculatum* (Linn.) (62) Strensall Common, June-July 1959-62; C.J.S. (63) Bentley Common, 16/5/70; C.A.H.
- T. pallens* (Bl.) (62) Strensall Common, June 1959-62; C.J.S. (63) Thorne Moors, 6/6/70; T.M.S.G. Haw Park, 30/8/69; D.W.M. (64) Askham Bog, May, June, and September 1959-62; C.J.S.
- Enoplagnatha thoracica* (Hahn) (62) Strensall Common, July 1959-62; C.J.S.
- Robertus lividus* (Bl.) (62) Strensall Common, June. (64) Askham Bog, most months, 1959-62; C.J.S.
- R. arundineti* (O.P.-Camb.) (64) Askham Bog, December-March 1959-62; C.J.S.
- Tetragnatha extensa* (Linn.) (62) Strensall Common, May-June 1959-62; C.J.S. (63) Thorne Moors, common amongst shaded grass near paths, 1969-70; T.M.S.G. Low Ellers (Potteric Carr), common, 31/5/70. Went Valley ♂♂, ♀♀ among *Carex*, 18/6/70; C.A.H. (64) Askham Bog, May and July 1959-62; C.J.S.
- T. montana* Simon (62) Strensall Common, May-June 1959-62; C.J.S. (63) Thorne Moors, in shaded grass by paths, 6/6/70; T.M.S.G. Armthorpe, very common in woods, -/5/70; C.A.H. (64) Askham Bog, May-July 1959-62; C.J.S.
- T. obtusa* C. L. Koch (64) Askham Bog, May, June 1959-62; C.J.S.
- Pachygnatha clercki* Sund. (62) Strensall Common, September 1959-62; C.J.S. (63) Inkle Moor ♀♀, 23/10/69. Thorne Moors ♀♀, 19/8/69; T.M.S.G. (64) Askham Bog, all months 1959-62; C.J.S.
- P. degeeri* Sund. (62) Strensall Common, September 1959-62; C.J.S. (63) Thorne Moors, ♀♀, 19/8/69; T.M.S.G. (64) Askham Bog, February, September and October 1959-62; C.J.S.
- Meta segmentata* (Clerck) (61) Skipwith Common. (62) Strensall Common, May, September, November 1959-62; C. J. S. Newby, Helmsley, 8/10/70; C.A.H. (63) Thorne Moors, 1969-70; T.M.S.G. Sandall Beat Wood, Auckley Common. Old Denaby, Low Ellers (Potteric Carr), Levitt Hagg, 1969-70; C.A.H. Haw Park, 30/8/69; D.W.M. (64) Askham Bog, May, September, October 1959-62; C.J.S.
- M.s. mengei* (Bl.) (61) Skipwith Common. (62) Strensall Common, May, September, November 1959-62; C.J.S. (63) Thorne Moors, May-June. 1969-70; T.M.S.G. Armthorpe, May-June 1970; C.A.H.
- M. merianae* (Scop.) (62) Strensall Common, September 1959-62; C.J.S. (63) Thorne Moors, under footbridge across a dyke, 6/6/70; T.M.S.G. (64) Askham Bcg, May and September 1959-62; C.J.S.
- Araneus diadematus* Clerck (62) Strensall Common, August-September 1959-62; C.J.S. Newby, 8/10/70; C.A.H. (63) Thorne Moors, very common growing to enormous sizes, mainly amongst bracken, 1969-70; T.M.S.G. Denaby Ings, 17/5/69. Old Denaby, 1969-70; C.J.D. Cusworth, 20/9/70; G.P.S. Low Ellers (Potteric Carr), 27/9/70. Auckley Common, 19/8/69. Sandall Beat Wood, 22/11/69; C.A.H. (64) Askham Bog, September 1959-62; C.J.S. (65) Aysgarth, 8/10/70; C.A.H.
- A. quadratus* Clerck (62) Strensall Common, September 1959-62; C.J.S. (63) Thorne Moors, common, favouring young birches and willow shrubs, 1969-70; C.A.H.
- * *A. marmosus* Clerck (61) Skipwith Common, 1959-62; C.J.S. (63) Thorne Moors, frequent on *Calluna* and low bushes, July-September 1969-70; T.M.S.G. (64) Askham Bog, September 1959-62; C.J.S. September 1965, *B.S.S.G. Bull.*, 29, 8. It is known from only seven other British localities.
- A. m. pyramidatus* Clerck (61) Skipwith Common, 1959-62; C.J.S. (63) Thorne Moors, common on *Calluna* and low bushes, July-October 1969-70; T.M.S.G. (64) Askham Bog, May, August, September 1959-62; C.J.S., -/9/65 (*B.S.S.G. Bull.* 29).

- * *A. cornutus* Clerck (62) Strensall Common, June 1959-62; C.J.S. (63*) Thorne Moors, July-October 1969; T.M.S.G. Low Ellers (Potteric Carr), May-June 1970; J.B., C.A.H.
- † *A. scloptarius* Clerck (63) Low Ellers (Potteric Carr), ♀ among *Carex* heads, 14/5/70; J.B., C.A.H. ♂ common among brambles, 27/9/70; C.A.H. Thorne Moors, ♂ among *Juncus* heads, 7/6/70; B.L. Went Valley, ♂ and ♀ among *Carex* heads, -/6/70; C.A.H., P.S.
- * *A. umbraticus* Clerck (63*) Thorne Moors ♂ and ♀ under bark of dead birches, 6/6/70; T.M.S.G. (64) Askham Bog, June 1959-62; C.J.S.
- A. redii* (Scop.) (62) Strensall Common, May-June 1959-62; C.J.S. (63) Thorne Moors, ♂ -/8/69; T.M.S.G.
- A. cucurbitinus* Clerck (63) Sprotborough, Sandall Beat Wood, Bentley Common, Went Valley, very common, May-August notably amongst foliage of young oaks, Lilac and Pear in urban gardens, 1969-70; C.A.H. (64) Askham Bog, May-August 1959-62; C.J.S.
- * *A. c. opistographus* Kulcz. (61) Skipwith Common. (62) Strensall Common, May 1959-62; C.J.S. (63*) Armthorpe, many males of this variety amongst the foliage of Holly, Lilac, Hawthorn and Oak, -/5/70; J.B., C.A.H.
- Singa albobittata* (Westr.) (62) Strensall Common, May-June 1959-62; C.J.S., -/9/65 (B.S.S.G. Bull. 29).
- * *S. pygmaea* (Sund.) (62) Strensall Common, May-June 1959-62; C.J.S. (63) Blaxton Common, ♀ swept from *Holcus* sp, 25/6/69; E. W. Aubrook.
- S. hamata* (Clerck) (62) Strensall Common, June 1959-62; C.J.S.
- Cercidia prominens* (Westr.) (62) Strensall Common, March, June 1959-62; C.J.S.
- Zygiella x-notata* (Clerck) (62) Newby, 26/12/69, Helmsley, 8/10/70; C.A.H. (63) Doncaster, very common, 1969-70. Low Ellers (Potteric Carr), common on railway buildings, 1969; C.A.H. Thorne Moors, on Colliery buildings, July-October 1969-70; T.M.S.G. (64) Askham Bog, September 1959-62; C.J.S. (65) Aysgarth, 18/10/70; C.A.H.
- Z. atrica* (C. L. Koch) (62) Strensall Common, September 1959-62; C.J.S. (63) Haw Park, ♀ 30/8/69; D.W.M. (64) Askham Bog, September-October 1959-62; C.J.S.
- Cyclosa conica* (Pallas) (63) Sandall Beat Wood, ♀ among Rhododendrons, 27/8/70; C.A.H. (64) Askham Bog, June 1959-62; C.J.S.
- Ceratinella brevipes* (Westr.) (64) Askham Bog, February, July, December 1959-620 C.J.S.
- C. brevis* (Wider) (61) Skipwith Common, June-July. (62) Strensall Common, March 1959-62; C.J.S.
- Wideria acuminata* (Bl.) (62) Strensall Common, August, November. (64) Askham Bog, February, December 1959-62; C.J.S.
- W. antica* (Wider) (62) Strensall Common, March 1959-62; C.J.S.
- W. cucullata* (C. L. Koch) (62) Strensall Common, February 1959-62; C.J.S.
- W. melanocephalus* (O. P.-Camb.) (62) Strensall Common, February, June 1959-62; C.J.S.
- Trachynella nudipalpis* (Westr.) (62) Strensall Common, March 1959-62; C.J.S.
- Cornicularia unicornis* (O. P.-Camb.) (62) Strensall Common, most months, 1959-62; C.J.S.
- Gnathonarium dentatum* (Wider) (61) Skipwith Common, July 1959-62; C.J.S.
- Gongylidum rufipes* (Sund.) (62) Strensall Common, June, November 1959-62; C.J.S.
- Dismodicus bifrons* (Bl.) (62) Strensall Common, May-June 1959-62; C.J.S.
- Hypomma bituberculatum* (Wider) (62) Strensall Common, June-July 1959-62; C.J.S.
- Gonatium rubens* (Bl.) (62) Strensall Common, September 1959-62; C.J.S.
- Maso sundevalli* (Westr.) (62) Strensall Common, June 1959-62; C.J.S.
- Peponocranium ludicrum* (O. P.-Camb.) (62) Strensall Common, May 1959-62; C.J.S.
- Pocadicinemis pumilia* (Bl.) (62) Strensall Common, March, May-July 1959-62; C.J.S.
- Oedothis thorax gibbosus* (Bl.) (61) Skipwith Common, July. (62) Strensall Common, March, June, November 1959-62; C.J.S.
- Oe. fuscus* (Bl.) (62) Strensall Common, July 1959-62; C.J.S.
- Silometropus elegans* (Bl.) (61) Skipwith Common, July. (62) Strensall Common, July 1959-62; C.J.S.
- * *Tiso vagans* (Bl.) (62) Strensall Common, March, November 1959-62; C.J.S. (63*) Haw Park, ♂ 30/8/69; D.W.M.
- Tapinocyba pallens* (O. P.-Camb.) (62) Strensall Common, March 1959-62; C.J.S.
- Manocephalus fuscipes* (Bl.) (62) Strensall Common, January 1959-62; C.J.S.

- Lophomma punctatum* (Bl.) (61) Skipwith Common, July 1959-62; C.J.S.
Gongyliidium vivum (O. P.-Camb.) (61) Skipwith Common, July 1959-62; C.J.S.
Erigonella hiemalis (Bl.) (62) Strensall Common, June 1959-62; C.J.S.
Savignia frontata (Bl.) (62) Strensall Common, January-February 1959-62; C.J.S.
Diplocephalus cristatus (Bl.) (62) Newby, in greenhouse, 26/12/69; C.A.H.
Diplocephalus permixtus (O. P.-Camb.) (61) Skipwith Common, June 1959-62; C.J.S.
Araeoncus crassiceps (West.) (62) Strensall Common, May-June 1959-62; C.J.S.
Erigone dentipalpis (Wid.) (62) Strensall Common, July 1959-62; C.J.S. (65) Aysgarth, ♂ 8/10/70; C.A.H.
E. atra (Bl.) (62) Strensall Common, May, July, November 1959-62; C.J.S.
Drepanotylus uncatus (O. P.-Camb.) (61) Skipwith Common, June 1959-62; C.J.S.
Hillhousia misera (O. P.-Camb.) (61) Skipwith Common, June-July. (62) Strensall Common, March, July 1959-62; C.J.S.
Meioneta rurestris (C. L. Koch) (62) Strensall Common, July 1959-62; C.J.S. (63) Haw Park, ♀ 30/8/69; D.W.M.
Microneta viaria (Bl.) (62) Strensall Common, May 1959-62; C.J.S.
Centromerus expertus (O. P.-Camb.) (62) Strensall Common, November 1959-62; C.J.S.
Centromerita bicolor (Bl.) (62) Strensall Common, November 1959-62; C.J.S.
C. concinna (Thor) (62) Strensall Common, July, September, November 1959-62; C.J.S.
Macrargus rufus (Wid.) (61) Skipwith Common, June, 1959-62; C.J.S.
Bathypantes concolor (Wid.) (62) Strensall Common, June 1959-62; C.J.S. (65) Aysgarth, ♀ 8/10/70; C.A.H.
B. approximatus (O. P.-Camb.) (62) Strensall Common, May-June 1959-62; C.J.S.
B. pullatus (O. P.-Camb.) (62) Strensall Common, May-September. (61) Skipwith Common, July 1959-62; C.J.S.
B. gracilis (Bl.) (61) Skipwith Common. (62) Strensall Common, July 1959-62; C.J.S. (63) Haw Park ♀ 30/8/69; D.W.M.
Poecilometes globosa (Sund.) (62) Strensall Common, November 1959-62; C.J.S.
Dracopis socialis (Sund.) Allertorpe Common, Strensall Common, Skipwith Common on coniferous trunks as well as birches, 1-7/6/65 (*B.S.S.G. Bull.* 29). (63) Haw Park, 2♂ ♀ dark specimens on birch trunks, 30/8/69; D.W.M. Sandall Beat Wood ♀ on birch trunk, 10/11/69. (65) Aysgarth, 2♀, 8/10/70; C.A.H.
Stemonyphantes lineatus (Linn.) (62) Strensall Common, February 1959-62; C.J.S. (63) Thorne Moors ♂, 15/5/69; T.M.S.G.
Bolyphantes luteolus (Bl.) (62) Strensall Common, February and November 1959-62; C.J.S.
Leptyphantes leprosus (Ohlert) (62) Newby ♂ ♀ (one ♀ with ichneumon parasite) in greenhouse, 26/12/69; C.A.H.
L. obsurus (Bl.) (62) Strensall Common, June 1959-62; C.J.S.
L. alacaris (Bl.) (62) Strensall Common, November 1959-62; C.J.S.
L. minutus (Bl.) (63) Sandall Beat Wood ♂, 10/11/69; C.A.H.
L. tenuis (Bl.) (62) Strensall Common, most months, 1959-62; C.J.S. Newby 3♀ in greenhouse, Forge Valley ♀, 26/12/69; C.A.H. (63) Haw Park ♀, 30/8/69; D.W.M.
L. zimmermanni Bert. (62) Strensall Common, late summer, 1959-62; C.J.S. (63) Haw Park 2♂, 30/8/69; D.W.M.
L. flavipes (Bl.) (62) Strensall Common, January, March, June 1959-62; C.J.S.
L. cristatus (Menge) (62) Strensall Common, March 1959-62; C.J.S.
L. mengei Kule (62) Strensall Common, February, November 1959-62; C.J.S.
L. tenebricola (Wid.) (62) Strensall Common, February, November 1959-62; C.J.S.
L. ericaeus (Bl.) (62) Strensall Common, March, September, November 1959-62; C.J.S.
Helophora insignis (Bl.) (63) Sandall Beat Wood ♀, 10/11/69; C.A.H.
Linyphia triangularis (Clerck) (62) Strensall Common, September-November 1959-62; C.J.S. (63) Haw Park 2♂ 2♀, 30/8/69; D.W.M. Auckley Common, Sandall Beat Wood, Thorne Moors, Armthorpe, Old Denaby, Levitt Hag, 1969-70; C.A.H.
L. montana (Clerck) (63) Thorne Moors common on Rhododendrons, 6-7/6/70; T.M.S.G.
L. clathrata Sund. (61) Skipwith Common, September. (62) Strensall Common, June 1959-62; C.J.S.
L. pusilla Sund. (62) Strensall Common, May-June 1959-62; C.J.S.

Plant Galls (T. F. Medd): As there has been no report for some time, I have included records covering the past two or three years. In appropriate circumstances only one selection has been given for each Vice-County. My thanks are due to Miss Rob (C.M.R.) for several records.

AGENT

COLEOPTERA

Apion frumentarium Payk. (62) Warthill Common, 26/6/68

HYMENOPTERA

Andricus fecundator Hartig (62) Raindale, 3/10/70

Andricus kollari Hartig (62) Helperby, 5/9/70

Andricus ostreus Hartig (64) Bishop Wood, Selby, 28/9/69

Aulacidea hieracii Bouché (61) Near Kiplingcotes Station, 2/8/69

Biorhiza pallida Olivier (62) Helperby, 5/9/70

Diplolepis rosae L. (61) Wintringham, 1/8/70; (62) Helperby, 5/9/70

Diplolepis rosae L. (61) Howsham Wood, 11/7/70

Neuroterus quercus-baccarum L. (61) Skipwith Common, 28/5/69; (62) Gormire, 29/6/69; C.M.R.

Neuroterus tricolor Hartig (61) Skipwith Common, 9/7/69; (64) Bishop Wood, 28/9/69

Pontania proxima Lepel. (62) Clifton Ings, 28/5/70; (64) Knaresborough Ringing Station, 6/9/69

Pontania vesicator Bremi (64) Wormald Green, 25/6/69; C.M.R.

Pontania viminalis L. (61) Skipwith Common, 9/7/69; (64) Bishop Wood, 28/9/69

DIPTERA

Chirosia parvicornis Zetter (62) Warthill Common, 26/6/68

Contarinia jacobaeae H. Low (64) York, 23/8/69

Contarinia loti De Geer (61) Kiplingcotes Chalk Pit, 2/8/69

Dasyneura crataegi Winnertz (61) Kiplingcotes, 2/8/69;

(62) York, 19/10/69; (64) Green Hammerton, 27/8/70

Dasyneura galiicola F. Low (61) Wintringham, 1/8/70; (62) Helperby, 5/9/70; (64) Askham Bog, 3/6/70

Dasyneura ulmariae Bremi (61) Howsham Wood, 11/7/70; (62) Raindale, 3/10/70; (64) Bishop Wood, 28/9/69

Geocrypta galii H. Löw (61) near Wintringham, 30/6/68

Harmandia globuli Rübsaamen (62) Strensall Common, 10/6/69

Jaapiella veronicae Vallot (61) Wintringham, 1/8/70; (62) Rievaulx, 26/8/70; (64) Bishop Wood, 28/9/69

HOMOPTERA

Livia juncorum Latreille (62) Overton, 13/8/70

Myzus cerasi Fabr. (61) Fulford, 20/10/68

Psyllopsis fraxini L. (61) Howsham Wood, 11/7/70; (62) Bridestones N.R., 20/6/70

ACARINA

Aceria hippophaenes Nalepa (61) Spurn, 21/9/68

Eriophyes avellanae Nalepa (62) Appleton-le-Moors, 25/5/69; C.M.R.

Eriophyes axillare Conn. (61) Fulford, York, 31/7/68 (62) Raindale, 3/10/70

Eriophyes brevitarus typicus Nalepa (62) Raindale, 3/10/70; (64) Knaresborough Ringing Station, 6/9/69

Eriophyes galii Karp (62) Hayburn Wyke, 20/9/70.

Eriophyes laevis inangulis Nalepa (62) Raindale, 3/10/70; (64) Askham Bog, 3/6/70

PLANT

Rumex tenifolius (Wallr.) Love.

Quercus robur L.

Quercus robur L.

Quercus robur L.

'*Hieracium tridentatum*'

Quercus robur L.

Rosa canina L.

Rosa arvensis Huds.

Quercus robur L.

Quercus robur L.

Salix fragilis L.

Salix caprea L.

Salix sp.

Dryopteris dilatata (Hoffm.) A. Gray

Senecio viscosus L.

Vicia cracca L. and

Lotus corniculatus L.

Crataegus monogyna Jacq.

Cruciata laevipes Opiz

Filipendula ulmaria (L.) Maxim.

Galium verum L.

Populus tremula L.

Veronica chamaedrys L.

Juncus articulatus L.

Prunus sp.

Fraxinus excelsior L.

Hippophae rhamnoides L.

Corylus avellana L.

Alnus glutinosa (L.) Gaertn.

Alnus glutinosa (L.) Gaertn.

Galium aparine L.

Alnus glutinosa (L.) Gaertn.

AGENT

- Eriophyes macrorrhynchus aceribus* Nalepa (61)
Heslington, 7/8/70; (62) New Earswick, 24/6/70;
(64) Bishop Wood, 28/9/69
Eriophyes megalonyx Nalepa (62) Raindale, 3/10/70;
(64) Bishop Wood, 28/9/69
Eriophyes similis Nalepa (61) Settrington Wood, 15/6/69
Eriophyes tiliae typicus Pagenst. (61) Wintringham,
1/8/70
NEMATODA
Tylenchus agrostidis Steinb. (61) Fulford Ings, 6/7/70
Tylenchus agrostidis Steinb. (62) Helperby, 5/9/70
FUNGI
Albugo candida Persoon ex S. F. Gray (62) Clifton,
York, 28/5/70
Taphrina deformans (Berkeley) Tulasne. (62) Catton
Hall, 29/6/69; C.M.R.

PLANT

- Acer pseudo-platanus* L.
Acer pseudo-platanus L.
Prunus domestica
ssp. domestica L.
Tilia vulgaris Hayne
Festuca arundinacea Schreb.
Dactylis glomerata L.
Capsella bursa-pastoris (L.)
Medic.
Prunus amygdalus Batsch.

BOTANY

PLANT RECORDS: EAST RIDING (E. Crackles)

A meeting was held in January 1970, to recruit help in collecting additional information for a Flora of the East Riding on a tetrad basis; the present report testifies to the stimulus which the scheme has provided. Numerous interesting records have been made. T. Dargie's discovery of *Parapholis incurva* on Spurn Point is the most notable; this is a new county record. True *Symphytum officinale* has been found by Eric Chicken at Woodhall. Examination by boat of further stretches of the River Hull has revealed that *Oenanthe fluviatilis* occurs twelve miles to the south of its first recorded East Yorkshire station and this extends the known range of this species into the tidal part of the river. *Chenopodium polyspermum* turned up in quantity in a pea field at Spaldington on the site of newly ploughed grassland. It has long occurred as a garden weed in the area. *Oenanthe crocata* has been found in quantity on Howden Dyke Island by R. and J. Hunt; it may possibly occur elsewhere, in wet woodland in the Ouse and Derwent valleys.

Confirmation of old records for rare species include *Osmunda regalis* still on Skipwith Common. Other rare East Yorkshire species for which at least one additional locality has been discovered include: *Actaea spicata*, *Chenopodium ficifolium*, *Myriophyllum verticillatum*, *Orobancha elatior*, *Utricularia vulgaris*, *Bidens tripartita*, *Alisma lanceolatum*, *Eleocharis quinqueflora*, *Carex divisa*, *Catapodium maritimum* and *Bromus commutatus*.

I am indebted to Dr. C. E. Hubbard for examination of a parcel of grasses collected in 1957, including identification of the rare hybrid *Festuca* × *gigas* found at Brigham.

Thanks are due to all who have contributed to this report. The inclusion of a grid-square reference indicates an addition to the distribution of a species as recorded in the *Atlas*, but such additional information is not given for well distributed species.

Key to contributors: E. Chicken (E.Ch.), Miss E. Crackles (E.C.), T. Dargie (T.D.), A. T. Dobson (A.T.D.), J. Eastwood (J.E.), R. and J. Hunt (R.H. and J.H.), T. F. Medd (T.F.M.), G. A. Shaw (G.A.S.), D. W. Shimwell (D.W.S.), Miss M. Taylor (M.T.) E. Thompson (E.T.).

Osmunda regalis L. Skipwith Common 44/63, confirming an old record; Y.N.U. Excursion.

Polystichum aculeatum (L.) Roth Howsham 44/76; M.T.

Polypodium vulgare L. Wressle 44/73; G.A.S. and E.T.

Ophioglossum vulgatum L. Snuff-mill Lane, Hull 54/03; K. Fenton. Skipwith Common 44/63; Y.N.U. Excursion.

Actaea spicata L. Leavening 44/76; A.T.D. A new locality for this square (*vide Nat.* 1967, 74).

Ranunculus sardous Crantz Thornholme 54/16; M.T.

Papaver lecoqii Lamotte Bridlington and Carnaby 54/16; M.T.

Coronopus squamatus (Forsk.) Aschers. Flamborough 54/26; M.T. Filey 54/18; T.F.M.

- Cardamine amara* L. Near R. Derwent at Wheldrake 44/64; E.Ch.
Hypericum humifusum L. Skipwith Common 44/63; T.F.M.
Saponaria officinalis L. Rudston 54/06; E.Ch.
Sagina maritima Don Spurn Point 54/41; T.D. per D.W.S.
Sagina nodosa (L.) Fenzl Easington 54/41; T.D. and A.T.D. per D.W.S.
Chenopodium polyspermum L. Spaldington 44/73; D.W.S.
Chenopodium ficifolium Sm. Howden Dyke Island 44/72; R.H. & J.H. per D.W.S.
Chenopodium rubrum L. Heslington Common 44/64; T.F.M.
Salsola kali L. Barmston 54/16; M.T.
Tilia platyphyllos Scop. Leavening 44/76; A.T.D. per D.W.S.
Malva neglecta Wallr. Thwing 54/07; E.Ch.
Lotus tenuis Waldst. & Kit. ex Willd. Thornholme 54/16; M.T.
Myriophyllum verticillatum L. Fulford Ings 44/64; T.F.M.
Oenanthe crocata L. Howden Dyke Island 44/72; R.H. & J.H. per D.W.S.
Oenanthe fluviatilis (Bab.) Coleman. River Hull, just south of Wilfholme 54/04; E.C.
Parietaria diffusa Mert. & Koch Bridlington 54/16 and Lowthorpe 54/06; M.T.
Salix purpurea L. Kelleythorpe 54/05 and Harpham 54/06; M.T.: near Boynton 54/16; E.Ch.
Erica tetralix L. Kenneythorpe Moor 44/76; A.T.D.
Vaccinium myrtillus L. Kenneythorpe 44/76; A.T.D.
Anagallis tenella (L.) L. Skipwith Common 44/63, confirming an old record; G.A.S. and E.T.
Glaux maritima L. Flamborough 54/27; M.T.
Samolus valerandi L. Brandesburton gravel pits 54/14; M.T.
Menyanthes trifoliata L. Near Acklam 44/76; A.T.D.
Symphylum officinale L. (*sensu stricto* det. F. Perring) Woodhall, near Wressle 44/63 E.Ch.
Mimulus guttatus DC. Fulford Ings 44/64; T.F.M.
Veronica scutellata L. Fraisthorpe 54/16; M.T.
Pedicularis sylvatica L. Fraisthorpe 54/16; M.T.
Lathraea squamaria L. Leavening 44/76, confirming an old record; A.T.D.
Orobanche elatior Sutton Bridlington 54/16; M.T.
Pinguicula vulgaris L. Near Acklam 44/76; A.T.D.
Utricularia vulgaris L. Cross Drain, Leven 54/04; M.T.; Leven Canal 54/04; E.C.
Bidens tripartita L. Howden Dyke Island 44/72; R.H. & J.H. per D.W.S.: Beverley 54/03; M. Hugill per E.C.
Anthemis arvensis L. Near Thwing 54/07; E.Ch.
Picris echioides L. Thornholme 54/16; M.T.
Crepis paludosa (L.) Moench Near Scarborough 54/04; E.C. and M.T.
Alisma lanceolatum With. Howden Common 44/73; E.C.
Epipactis helleborine (L.) Crantz Risby 54/03; confirming an old record; D.W.S.
Dactylorhiza fuchsii (Druce) Soo $\times$ *D. incarnata* (L.) Soo Carnaby 54/16; E.C.
Dactylorhiza fuchsii (Druce) Soo $\times$ *D. praetermissa* (Druce) Soo Specimen from near Scarborough 54/04, is probably this hybrid; E.C.
Dactylorhiza fuchsii (Druce) Soo $\times$ *D. purpurella* (T. & T. A. Stephenson) Soo Carnaby airfield 54/16; E.C. conf. V. Summerhayes.
Dactylorhiza incarnata (L.) Soo Carnaby airfield 54/16; M.T.
Dactylorhiza incarnata subsp. *pulchella* (Druce) Soo Carnaby airfield 54/16; E.C.
Dactylorhiza praetermissa (Druce) Soo Near Scarborough 54/04; M.T. and E.C. conf. V. Summerhayes.
Scirpus setaceus L. Wansford 54/05; M.T.
Eleocharis quinqueflora (F. X. Hartmann) Schwarz Great Givendale 44/85, Kings Mill 54/05 and Flamborough 54/27; M.T.
Carex lepidocarpa Tausch Near Acklam 44/76; A.T.D.: Deep Dale, Great Givendale 44/85; E.C.
Carex demissa Hornem. Carnaby 54/16; M.T.
Carex paniculata L. Near Scarborough 54/04; E.C.
Carex divisa Huds. Hessele foreshore 54/02; T.D. and J.E. per D.W.S.
Carex echinata Murr. Deepdale, Great Givendale 44/85; E.C.
Carex ovalis Gooden. Fraisthorpe 54/16; M.T.
Sieglingia decumbens (L.) Bernh. Fraisthorpe 54/16; M.T.
Glyceria fluitans (L.) R.Br. $\times$ *G. plicata* Fr. = *G. plicata* Towns end Flotmanby Carrs 54/07, 1957; E.C., det. C. E. Hubbard.

- Festuca arundinacea* Schreb. × *F. gigantea* (L.) Vill. = *F. × gigas* Holmberg Brigham 54/05, 1957; E.C., det. C. E. Hubbard.
- Lolium perenne* L. × *L. multiflorum* Lam. (= *L. × hybridum* Hausskn.) Welham 44/76, 1957; E.C., det. C. E. Hubbard
- Catapodium marinum* (L.) C. E. Hubbard King George Dock, Hull 54/12, 1957; E.C., det. C. E. Hubbard.
- Poa compressa* L. Hessle Quarry 54/02; T.D. and J.E. per D.W.S.
- Catabrosa aquatica* (L.) Beauv. Flamborough 54/27; M.T.
- Bromus mollis* L. var *leioctachys* Hartm. Deepdale, North Newbald 44/93, 1957; E.C., det. C. E. Hubbard.
- Bromus thominii* Hardouin (*sensu lato*) Worsendale 44/85, Langwith Common 44/64, Welham 44/76, Brigham 54/05, and Langton 44/86, 1957; E.C., det. C. E. Hubbard.
- Bromus thominii* var *hirsutus* (Holmb.) Langton 44/86, 1957; E.C., det. C. E. Hubbard.
- Bromus commutatus* Schrad. Wheldrake Ings, 44/64 + 44/74, 1957; E.C., det. C. E. Hubbard.
- Agropyron repens* (L.) Beauv. var *aristatum* Baumg. Pulfin Bend 54/04, 1957; E.C., det. C. E. Hubbard.
- Agropyron pungens* (Pers.) Roem. and Schult. var. *setigerum* Dumort. Spurn Point 54/41, 1957; E.C., det. C. E. Hubbard.
- Alopecurus myosuroides* Huds. Burstwick 54/22; E.C.
- Parapholis strigosa* (Dumort.) C. E. Hubbard Barmston 54/16; K. F. P. Burkitt.
- **Parapholis incurva* (L.) C. E. Hubbard Spurn Point 54/41; T.D. (*Nat.*, 1970, 131).

WEST RIDING: (F. Murgatroyd)

The discovery of *Cicuta virosa* in West Yorkshire, reported in the last issue of *The Naturalist*, is a record of outstanding interest. The species had long been considered extinct in Yorkshire, the last known record having been made in East Yorkshire a century ago. Four other records are of particular interest; the finding of *Trientalis europaea* at Brimham Rocks confirms an old record dating back to Lees' *Flora* and the discovery of *Limosella aquatica* at Gouthwaite Reservoir constitutes an addition to the Nidderdale flora. *Dipsacus pilosus* though known to the late Rev. P. M. Garnett at Sprotborough has not previously been published from this station. Several West Riding stations are now known for the hybrid *Vaccinium intermedium* but Mr. Shaw's report of it from Agra Moor (*Nat.*, 1970, 132) constitutes a new record for V.C. 65.

Nearly all the other records listed below are from 10 km. squares for which there is no entry in the *Atlas*. Record cards have been filled in and forwarded to the Biological Records Centre for these and for a number of other species which are similarly omitted from the *Atlas* but which are too generally distributed in West Yorkshire to merit inclusion here.

- Cochlearia alpina* (Bab.) H. C. Wats. (64) West Chevin near Ellar Ghyll, Otley 44/24; F. Houseman.
- Rorippa sylvestris* (L.) Bess. (64) By River Barden, Appletreewick 44/05; H. Lefevre. (63) Roadside verge, Illingworth, Halifax 44/02; F.M.
- Stellaria nemorum* L. (64) Farnley lakeside 44/24; F. Houseman. (64) Pool Papermill 44/24; L. Magee.
- Malva moschata* L. (63) Marley nr. Bingley 44/04; Keighley Nats.
- Geranium pratense* L. (63) Field nr. Oldtown, Hebden Bridge 44/02; F.M. New to Halifax Parish.
- **Rubus eboracensis* W. C. R. Wats. Det. E. S. Edees (64) Hedge at Collingham 44/34; F. Houseman.
- Apium inundatum* (L.) Reichb.f. (64) Yeadon Moor 44/24; L. Magee.
- **Cicuta virosa* L. (64) Green Hammerton; Mrs. E. M. S. Newfield and Miss C. M. Holmes (see *Nat.*, 1970, 131).
- Oenanthe crocata* L. (63) Canal, Smithies, Barnsley 44/30; L. Magee.
- Rumex alpinus* L. (64) Near Willsill, Pateley Bridge 44/26; C. Webb.
- Trientalis europaea* L. (64) Brimham Rocks 44/26; Mrs. M. S. Boyle via Miss M. Wray.
- Lysimachia punctata* L. (64) York Plantation, Yeadon 44/24; Creskeld Lane, Arthington 44/24; Crossflatts 44/14; L. Magee. (63) Eccleshill, Bradford 44/13; L. Magee. Shelf Wood, Halifax 44/12; Hx. Scientific Soc.
- Vaccinium × intermedium* Ruthe. (63) Rishworth, Halifax 44/01; F.M.
- Mimulus guttatus* DC. (64) Tolson's lagoon and sandbeds, Otley 44/24; F. Houseman: River Wharfe, Arthington 44/24; L. Magee.
- Mimulus luteus* L. (64) Island in Wharfe, near papermill Otley; F. Houseman.

- Limosella aquatica* L. (64) Gouthwaite Reservoir 44/16; Mrs. D. Haythornthwaite. New to Nidderdale.
- Orobanche minor* Sm. (64) Clover field, Sherburn 44/43; G. A. Shaw.
- Mentha* × *piperita* L. (63) Bierley Hall, Bradford 44/13; L. Magee.
- Stachys* × *ambigua* Sm. (63) Fleet near Barnsley 44/30; L. Magee. (64) Kirkby Malham 34/86; Mrs. J. Duncan.
- Sambucus ebulus* L. (63) Railway bank, Portsmouth; Cliviger, near Todmorden 34/82; F.M.
- Dipsacus pilosus* L. (63) Engine Wood, Sprotborough 44/50; P. Skidmore. Seen in this station by the late Rev. P. M. Garnett and so recorded on the card in the file, but not published in the *Naturalist*.
- Petasites albus* (L.) Gaertn. (63) Walton Hall, Wakefield 44/31; R. F. Dickens.
- Petasites fragrans* (Vill.) C. Presl. (64) Byram Park 44/52; Y.N.U. Exc.
- Chrysanthemum segetum* L. (64) Cornfield, Collingham 44/34; F. Houseman.
- Hieracium decolor* (W. R. Linton) A. Ley Det. J. N. Mills (64) Grass Wood, Grassington 43/96; F. Houseman
- H. perpropinquum* (Zahn) Druce. Det. J. N. Mills (64) Newthorpe quarry, Micklefield 44/34; F. Houseman
- H. pellucidum* Laest. Det. J. N. Mills Roadside near Bolton Bridge 44/05; F. Houseman.
- Butomus umbellatus* L. (64) Canal at Bramley 44/23; D. Grant.
- Convallaria majalis* L. (63) St. Ives, Bingley 44/03; Keighley Nats.
- Juncus* × *diffusus* Hoppe (64) Knotford Nook 44/24; L. Magee.
- Allium scorodoprasum* L. (64) Riddlesden, Keighley 44/04; Keighley Nats.
- Galanthus nivalis* L. (64) Washburn Valley 44/24; L. Magee.
- Scirpus lacustris* L. (63) Marley near Bingley 44/04; Keighley Nats.
- Carex pendula* Huds. (64) Dob Park 44/15; L. Magee; Lindley Reservoir and Lindley Bridge 44/24; L. Magee.
- Carex pallescens* L. (63) North Beck, Keighley 44/04; D. Grant.
- Carex acuta* L. (64) Burley 44/14; L. Magee.
- Carex paniculata* L. (63) Hewenden, near Cullingworth 44/03; D. Grant.
- Carex otrubae* Podp. (63) Smithies, Barnsley 44/30; L. Magee.
- Carex disticha* Huds. (64) Knotford Nook, Otley 44/24; L. Magee.
- Carex divulsa* Stokes (63) Fishlake 44/61; D. Grant.
- Poa nemoralis* L. (64) Milner Wood, Otley and Weston, Otley 44/14; F. Houseman.
- Apera spica-venti* (L.) Beauv. (63) Great Heck 44/52; D. Grant.

CASUALS AND ADVENTIVES: (Mrs. F. Houseman)

There have been fewer records of aliens during 1970. Many country lanes and minor roadsides have adventives originating from dumped garden rubbish. Some of these have become established. Wool aliens are still scarce and those seen were dried up, having flowered earlier this year.

The following people contributed to the list: E. Chicken, Miss E. Crackles, R. F. Dickens, Mrs. F. Draper, Mrs. J. Duncan, Mrs. F. Houseman, S. Jackson, Miss R. Kilby, Miss J. Lambert, Dr. G. A. Nelson, Rev. C. E. Shaw and D. W. Shimwell.

- Aconitum anglicum* Stapf (64) Edge of cornmill stream, Leathley; F.H.
- A. variegatum* L. (64) Roadside, Forest Moor; F.H.
- Delphinium ambiguum* L. (61) Resurfaced quarry, Burton Fleming; E. Chicken
- Meconopsis cambrica* (L.) Vig. (64) By riverbank, Bolton Abbey; J.D.
- Erucastrum gallicum* (Willd.) Schulz (61) Old chalk quarry, Hessle; E.C.
- Lepidium rudemale* L. (64) Burley in Wharfedale; F.D.
- Cardamine raphanifolia* Pourr. (62) By Lealholm Beck; F.H.
- Lunaria annua* L. (64) By riverbank, Bolton Abbey; J.D.
- Neslia paniculata* (L.) Desvaux (64) Guiseley tip; F.H.
- Amaranthus blitoides* S.Wats. (64) Guiseley tip; F.H.
- Oxalis corniculata* L. (61) Weed in Sewerby Park garden; F.H. Pocklington; G.A.N.
- Impatiens parviflora* DC. (64) Single plant in school garden, Ferry Fryston, Castleford; R.F.D.
- Laburnum anagyroides* Medic. (64) Riverbank nr. Ilkley; F.H.
- Medicago falcata* L. (61) 54/13 Established 10 years, Leeds Road tip, Hull; E.C.
- Melilotus officinalis* (L.) Pall. (61) Roadside B1253 Sledmere to Bridlington; F.H.
- Potentilla norvegica* L. (64) Hirst Wood tip, nr. Saltaire; S. Jackson per K. Scorer and G. A. Shaw.
- Philadelphus coronarius* L. (63) South canal bank, Shipley; F.H.

- Lythrum junceum* Banks & Soland. (64) Ings tip, Otley; F.H.
Euphorbia lathyris L. (61) Garden weed, Thwing; E. Chicken.
Fagopyron esculentum Moench (64) Ings tip, Otley; F.H. Off Ings Lane, Thorparch; R.K.
Humulus lupulus L. (64) On Sycamore by riverbank, Leathley; C.E.S.
Cannabis sativa L. (64) Two plants, Guiseley tip; F.H.
Cyclamen hederifolium Ait. (61) Naturalised in woodland and shrubberies, Sewerby Park; G.A.N.
Borago officinalis L. (64) Malham; G.A.N.
Cuscuta campestris Yunker (62) Growing on *Godetia* in garden at Skelton, nr. York; J.L.
Nicandra physaloides (L.) Gaertn. (64) Ings tip, Otley; F.H.
Physalis ixocarpa Brot. ex Hornem. (64) Ings tip, Otley; F.H.
Solanum rostratum Dunal (64) Guiseley tip; F.H.
Verbascum pulverulentum Vill. (61) Roadside B1253 Sledmere to Bridlington; F.H.
Antirrhinum majus L. (61) Old wall, The Balk, Pocklington; G.A.N.
Veronica filiformis Sm. (61) Golf course at Sewerby Park carpeted with this plant; F.H. (62) Lealholm village; F.H.
Lamium maculatum L. (64) Abundant by wall in long grass, Askwith Moor Road, nr. Otley; F.H.
Solidago altissima L. (64) Riverbank, Sandbeds, Otley; F.H.
Aster longifolius Lam. (64) Riverbank, Sandbeds, Otley; F.H.
Conyza canadensis (L.) Cronq. (61) Waste ground, Victoria Dock, Hull; E.C.
Anthemis tinctoria L. (61) Resurfaced quarry, Burton Fleming; E.C.
Centaurea cyanus L. (61) With the above; E.C.
Onopordum acanthium L. (61) 44/83 Nr. Holme upon Spalding Moor; E.C. & D.W.S.
Cicerbita macrophylla (Willd.) Wallr. (64) Two sites by roadside, Glasshoughton, Castleford; R.F.D.
Hordeum jubatum L. (64) Roadside, A63, Swillington Common; F.H.

BRYOLOGY

MUSCI (M. Dalby)

A spring meeting at Danes' Dyke (V.C. 61) in April and an autumn weekend at Ingleton (V.C. 64) in September have been the official programme of the Y.N.U. Bryological Section for 1970, both will be reported in detail elsewhere. In addition members have carried out a survey of the bryophytes of a small area of Thorne Waste (V.C. 63) in March and June in conjunction with the Doncaster Museum, finding it tough going but of intense interest in its succession of plants and constantly changing habitats.

The exposed mud of the reservoirs during the dry autumn of 1969 and summer of 1970 has again produced a number of excellent records. Stocks reservoir in V.C. 64 was examined by Dr. J. Duckett who found *Dicranella staphylina*, *Weissia rostellata*, *Ephemerum sessile* and *E. serratum* var. *serratum*. *Dicranella staphylina* is of particular interest as it was first reported in the B.B.S. Transactions of 1969 by Dr. H. L. K. Whitehouse as a new European species. Since then it has been found in two places in Yorkshire for Mrs. J. A. Paton recorded it from a stubble field near Catton (V.C. 62) during the B.B.S. meeting at Northallerton in 1967. Damflask reservoir, Loxley, Low Bradfield (V.C. 63) was visited by Mr. Brian O'Shea in December 1969 when he found *Physcomitrium sphaericum*, *Ephemerum serratum* var. *serratum* and *Bryum tenuisetum*, all new to V.C. 63. The discovery of *Physcomitrium sphaericum* extends the range of a comparatively rare species which has hitherto only been recorded from V.C. 64 at Copgrove and the Washburn valley. *Bryum tenuisetum* is also a notable find, its only previous record in the county being in July 1927 from Melbourne (V.C. 61) by W. H. Burrell.

Dicranum strictum reported on by Mr. Branson in an article in *The Naturalist*, 1963, 146, continues to extend its range. It was found in V.C. 61 during the excursion to Dane's Dyke in April. The first record of this plant in the county was in 1914 in V.C. 64.

Dr. Cockram of Middlesbrough has been doing a lot of work on the distribution and growth requirements of *Mielichhoferia elongata* in Cleveland following up his paper on this subject in *The Naturalist*, 1970, 59-62.

(Continued on page 32)

THE YORKSHIRE

Profit & Loss Account

£	s.	d.		£	s.	d.	£	s.	d.
			GENERAL PRINTING:						
			Circulars	87	17	10			
			Members Cards	32	14	0			
			Brochures and Membership Forms	65	12	9			
			Sundries	13	9	0			
85	15	8							199 13 7
			<i>The Naturalist</i>	980	10	9			
			Less Sales to non-members	198	10	0			
802	11	11							782 0 9
70	9	3	Newsletter						92 3 9
46	5	1	Officers Expenses and Postages						81 13 3
7	17	0	Duplicating and Stationery						16 16 8
10	2	10	Bank Charges						12 16 2
11	10	0	Subscriptions and Donations						10 0 0
			Yorkshire Show Exhibition						17 15 0
			Surplus						474 7 6
£1,034	11	9							£1,687 6 8

Balance Sheet as at

£	s.	d.		£	s.	d.	£	s.	d.
			ACCUMULATED FUNDS GENERAL						
			Booth Fund	100	0	0			
			Cheesman Fund	100	0	0			
			R. C. Fowler Jones Legacy	250	0	0			
			E. G. Bayford Legacy	100	0	0			
			R. Chislett Legacy	500	0	0			
			Anonymous Fund	250	0	0			
1,300	0	0							1,300 0 0
			MYCOLOGICAL FUND						
			Balance brought forward	175	5	7			
			Add Sales Cortinarius	1	5	4			
175	5	7							176 10 11
1,147	6	0	ORNITHOLOGICAL FUND CAPITAL						1,147 6 0
			ORNITHOLOGICAL FUND REVENUE						
			Balance brought forward	243	2	1			
			Interest on Investments	66	0	0			
243	2	1							309 2 1
			LIFE MEMBERS ACCOUNT						
			Balance brought forward	92	15	0			
			Less transfer to Subscription Account	15	0	0			
92	15	0							77 15 0
			SUNDRY CREDITORS						
			Courier Printers <i>The Naturalist</i>	232	1	11			
			Sundries	15	15	8			
									247 17 7
			PROFIT AND LOSS ACCOUNT						
			Balance brought forward	787	10	5			
			Add Profit	474	7	6			
787	10	5							1,261 17 11
£3,745	19	1							£4,520 9 6

NATURALISTS' UNION

September 30th, 1970

£	s.	d.						£	s.	d.	£	s.	d.
739	9	11	Subscriptions and Donations	...	...	...	...				1,229	19	6
15	0	0	Life Members	...	...	...	...				15	0	0
131	11	0	Income Tax refund on Covenants	...	...	...	...				222	19	7
95	11	0	Interest and Dividends	...	...	...	...				158	19	8
			Sale of Publications	...	...	...	...	155	7	11			
			Less printing of Lepidoptera List	...	...	...	...	95	0	0			
41	2	11									60	7	11
11	16	11	Deficit (1969)	...	...	...	...						

£1,034 11 9

£1,687 6 8

AUDITORS' REPORT

We have audited the foregoing Income and Expenditure Account and Balance Sheet of the Yorkshire Naturalists' Union with the books, records and vouchers submitted to us and certify the same to be in accordance therewith and with the information and explanations we have received.

WHITHAM, SMITH, MITCHELL & CO.,

4-6 Harrison Road,
Halifax.

14th January 1971

September 30th, 1970

£	s.	d.						£	s.	d.	£	s.	d.
			INVESTMENT AT COST										
			ORNITHOLOGICAL ACCOUNT										
			Nicholas Fund 3% Br. Transport	...	...	...	...	100	0	0			
			Chislett Legacy:										
			£600 Treasury Stk. 5½% 2008/12	...	...	...	...	545	9	0			
			£600 Treasury Stk. 5% 86/89	...	...	...	...	501	17	0			
											1147	6	0
			GENERAL ACCOUNT										
			Booth Fund 3½% Conversion Stock	...	...	...	...	100	0	0			
			Cheesman Fund 3½% War Stock	...	...	...	...	100	0	0			
			4% Concols (B. of E.)	...	...	...	...	200	0	0			
			4% Concols (P.O.)	...	...	...	...	159	10	11			
			£386 5½% Treasury Stock 2008/12	...	...	...	...	250	0	0			
			300 Unilever Ordinary Shares	...	...	...	...	522	1	6			
			250 Shell Transport Ordinary Shares	...	...	...	...	511	7	0			
											1,842	19	5
											2,990	5	5
			Less Reserve for Depreciation	...	...	...	...				235	0	0
2,755	5	5									2,755	5	5
			BANK ACCOUNTS										
			York County T.S.B.	...	...	...	...	492	19	8			
			Nat. West Bank Current A/c	...	...	...	...	242	10	7			
			Nat. West. Bank Deposit A/c	...	...	...	...	709	7	11			
898	2	10									1,444	18	2
			SUNDRY DEBTORS										
			Accrued Interest	...	...	...	...	36	10	0			
			Tax repayable on Dividends	...	...	...	...	55	16	4			
			Tax repayable on Covenants	...	...	...	...	222	19	7			
			Sundries	...	...	...	...	5	0	0			
92	10	10									320	5	11
£3,745	19	1									£4,520	9	6

THE YORKSHIRE

Profit & Loss Account

£ s. d.		£ s. d.	£ s. d.
	GENERAL PRINTING:		
	Circulars	87 17 10	
	Members Cards	32 14 0	
	Brochures and Membership Forms	65 12 9	
	Sundries	13 9 0	
85 15 8			199 13 7
	<i>The Naturalist</i>	980 10 9	
	Less Sales to non-members	198 10 0	
802 11 11			782 0 9
70 9 3	Newsletter	92 3 9	
46 5 1	Officers Expenses and Postages	81 13 3	
7 17 0	Duplicating and Stationery	16 16 8	
10 2 10	Bank Charges	12 16 2	
11 10 0	Subscriptions and Donations	10 0 0	
	Yorkshire Show Exhibition	17 15 0	
	Surplus	474 7 6	
£1,034 11 9		£1,687 6 8	

Balance Sheet as at

£ s. d.		£ s. d.	£ s. d.
	ACCUMULATED FUNDS GENERAL		
	Booth Fund	100 0 0	
	Cheesman Fund	100 0 0	
	R. C. Fowler Jones Legacy	250 0 0	
	E. G. Bayford Legacy	100 0 0	
	R. Cissett Legacy	500 0 0	
	Anonymous Fund	250 0 0	
1,300 0 0			1,300 0 0
	MYCOLOGICAL FUND		
	Balance brought forward	175 5 7	
	Add Sales Cortinarius	1 5 4	
175 5 7			176 10 11
1,147 6 0	ORNITHOLOGICAL FUND CAPITAL		1,147 6 0
	ORNITHOLOGICAL FUND REVENUE		
	Balance brought forward	243 2 1	
	Interest on Investments	66 0 0	
243 2 1			309 2 1
	LIFE MEMBERS ACCOUNT		
	Balance brought forward	92 15 0	
	Less transfer to Subscription Account	15 0 0	
92 15 0			77 15 0
	SUNDRY CREDITORS		
	Courier Printers <i>The Naturalist</i>	232 1 11	
	Sundries	15 15 8	
			247 17 7
	PROFIT AND LOSS ACCOUNT		
	Balance brought forward	787 10 5	
	Add Profit	474 7 6	
787 10 5			1,261 17 11
£3,745 19 1		£4,520 9 6	

NATURALISTS' UNION

September 30th, 1970

£ s. d.		£ s. d.	£ s. d.
739 9 11	Subscriptions and Donations		1,229 19 6
15 0 0	Life Members		15 0 0
131 11 0	Income Tax refund on Covenants		222 19 7
95 11 0	Interest and Dividends		158 19 8
	Sale of Publications	155 7 11	
	Less printing of Lepidoptera List	95 0 0	
41 2 11			60 7 11
11 16 11	Deficit (1969)		
£1,034 11 9		£1,687 6 8	

AUDITORS' REPORT

We have audited the foregoing Income and Expenditure Account and Balance Sheet of the Yorkshire Naturalists' Union with the books, records and vouchers submitted to us and certify the same to be in accordance therewith and with the information and explanations we have received.

WHITHAM, SMITH, MITCHELL & CO.,
4-6 Harrison Road,
Halifax.

14th January 1971

September 30th, 1970

£ s. d.		£ s. d.	£ s. d.
	INVESTMENT AT COST		
	ORNITHOLOGICAL ACCOUNT		
	Nicholas Fund 3% Br. Transport	100 0 0	
	Chislett Legacy:		
	£600 Treasury Stk. 5 1/2% 2008/12	545 9 0	
	£600 Treasury Stk. 5% 86/89	501 17 0	
	GENERAL ACCOUNT		1147 6 0
	Booth Fund 3 1/2% Conversion Stock	100 0 0	
	Cheesman Fund 3 1/2% War Stock	100 0 0	
	4% Concols (B. of E.)	200 0 0	
	4% Concols (P.O.)	159 10 11	
	£386 5 1/2% Treasury Stock 2008/12	250 0 0	
	300 Unilever Ordinary Shares	522 1 6	
	250 Shell Transport Ordinary Shares	511 7 0	
			1,842 19 5
	Less Reserve for Depreciation		2,990 5 5
2,755 5 5			2,350 0 0
	BANK ACCOUNTS		2,755 5 5
	York County T.S.B.	492 19 8	
	Nat. West Bank Current A/c	242 10 7	
	Nat. West Bank Deposit A/c	709 7 11	
898 2 10			1,444 18 2
	SUNDRY DEBTORS		
	Accrued Interest	36 10 0	
	Tax repayable on Dividends	55 16 4	
	Tax repayable on Covenants	222 19 7	
	Sundries	5 0 0	
92 10 10			320 5 11
£3,745 19 1		£4,520 9 6	

† denotes county record

* vice-county record

- *44/71 *Sphagnum subsecundum* var. *subsecundum* Nees (63) Silted up canal Thorne Waste, March 1970; M. Dalby.
- *44/71 *S. robustum* (Russ.) Roll. (63) Among heather, Thorne Waste, March 1970; M. Dalby.
- †44/37 *Dicranella staphylinia* Whitehouse (62) Stubble field near Catton, Sept. 1967; J. A. Paton.
- *34/75 *D. staphylinia* Whitehouse (64) Bare mud, Stocks reservoir, August 1969; J. Duckett.
- *54/26 *Dicranum strictum* Schleich. ex Schwaegr. (61) On elder, hawthorne and crab, Dane's Dyke, April 1970; G. A. Shaw, M. Dalby and E. Thompson.
- *34/78 *Dicranodontium denudatum* (Brid.) Britt. (65) Turfy ground, Whernside, August 1969; J. Appleyard.
- *34/68 *Tortula subulata* var. *subinermis* (B.&S.) Wils. (65) Base of tree by R. Dee 3 miles SW of Sedbergh, August 1969; Townsend.
- *34/78 *Trichostomum crispulum* var. *nigroviride* (Braithw.) Dix. (65) Limestone rocks near summit of Whernside, August 1969; J. Appleyard.
- *34/75 *Weissia rostellata* (Brid.) Lindb. (64) Gravelly mud, Stocks reservoir, August 1969; J. Duckett.
- *43/29 *Physcomitrium sphaericum* (Schkuhr) Brid. (63) Exposed mud, Damflask reservoir, Loxley, December 1969; B. O'Shea.
- †34/75 *Ephemerum sessile* (Bruch) Rabenh. (64) Bare mud, Stocks reservoir, August 1969; J. Duckett.
- *34/75 *E. serratum* var. *serratum* (Hedw.) Hampe (64) Bare mud, Stocks reservoir, August 1969; J. Duckett.
- *43/29 *E. serratum* var. *serratum* (Hedw.) Hampe (63) Bare mud, Damflask reservoir Loxley, December 1969; B. O'Shea.
- *34/69 *E. serratum* var. *minutissimum* (Lindb.) Grout (65) By Cautley Beck Sedbergh, August 1969; E. M. Lobley and M. Dalby.
- *43/29 *Bryum tenuisetum* (63) Damflask reservoir, Loxley, August 1969; B. O'Shea.
- *34/79 *Philonotis caespitosa* Wils. ex Milde (65) Vertical cliff, Uldale, August 1969; F. E. Branson.
- *54/26 *Orthotrichum pulchellum* Brunton (61) On elder, Danes' Dyke, April 1970; M. Gow and F. E. Branson.
- *34/78 *Uloa phyllantha* Brid. (65) Birch by Great Blake Beck, ca. 1,000 ft., NE of Whernside, August 1969; Morton and Perry.
- *35/92 *Fontinalis antipyretica* var. *gigantea* (Sull.) Sull. (65) S. bank of R. Tees near Holwick Bridge, October 1968; J. A. Paton.
- *44/29 *Plagiothecium ruthei* Limpr. (63) Edge of boggy pool, Haychatter Inn, Bradfield, June 1969; M. Gow.
- †34/77 *Hypnum callichroum* (Brid.) B.S.&G. (64) Siliceous boulders, Twistleton Glen, Ingleton, August 1969; Perry and Morton.
- Nomenclature and sequence follow the *Census Catalogue of British Mosses*, 1963, E. F. Warburg.

HEPATICA (F. E. Branson)

There have not been quite so many records this year as in previous years, but it has produced some quite interesting ones. On the visit to Danes' Dyke by the Y.N.U. Bryological Section on 18th April this year, it was most gratifying to see so much *Metzgeria fruticulosa* covering the trunks and branches of old elder trees with a golden yellow colour. Although not a first record for V.C. 61 it is a second record. *Metzgeria furcata* was also present in the same area. I saw *Riccardia pinguis* on Skipwith Common (V.C. 61) at the Whitsuntide meeting.

The following are all vice-county records:

- 34/78 *Marchantia polymorpha* L. var. *alpestris* Nees. (64) Wet ledges on limestone cliffs, E. slope of Penyghent, August 1969; J. Duckett.
- 34/79 ditto. (65) Rocks in R. Rawthey, Wandale August 1969; Duckett, B.B.S. Excursion.
- 44/16 *Riccia warnstorffii* Limpr. (64) Mud margin of Gouthwaite Reservoir, near Pateley Bridge, August 1969; J. Appleyard.
- 54/17 *Metzgeria fruticulosa* (Dicks.) Evans (61) On elder in ravine, Reighton Gap, Filey, November 1969; M. Dalby.

- 34/89 *Ptilidium pulcherrimum* (Weber) Hampe. (65) On elm by river, Shaw Gill Wood, Hardraw, August 1969; Appleyard, Dalby and Lobley, B.B.S. Excursion.
- 34/79 *Lophozia excisa* (Dicks.) Dum. (65) On boulders by R. Rawthey, Wandale, August 1969; J. Duckett, B.B.S. Excursion.
- 34/78 *Jamesoniella autumnalis* (DC.) Steph. (64) At 2,000 ft. Whernside; no collector or date (C.M.M.).
- 44/64 *Mylia anomala* (Hook.) Gray (61) Bog on Skipwith Common, March 1969; Wood. This is to remove brackets in B.B.S. *Census Catalogue*. I saw this myself on the Y.N.U. Whitsuntide meeting at Skipwith Common in 1970.
- 44/63 *Cephalozia rubella* (Nees) Warnst. (61) Bog, Skipwith Common, March 1969; Wood.

PROTECTION OF BIRDS ACT COMMITTEE: REPORT FOR 1970

During the year the Committee has been actively engaged in co-operation with the R.S.P.B. in the protection of breeding birds and the taking of young birds of prey by so called falconers. The film "Kes", excellent as a film, has led several young people into trouble when they have taken young kestrels.

All fishing boat owners at Scarborough, Bridlington, Filey and Flamborough have been told that the use of power boats by shooting parties is illegal and the relevant portions of the Protection of Birds Acts have been emphasised.

The shooting of sea birds at Bempton and herons near Skipton have given cause for concern; and the poisoning of birds of prey by strychnine in eggs and carrion has been prevalent in N.W. Yorkshire.

Limited success only has been achieved in preventing low-flying aircraft from disturbing nesting sea birds at Bempton.

3,300 of the following publications have been distributed to all schools in Yorkshire other than those on Teesside who are dealt with by the Teesmouth Bird Club:

"Do you know" a question and answers leaflet by the R.S.P.B.

About Bird Protection

Wild Birds and the Law

School Grounds and Bird Reserves

The setting of gin and pole traps continue to be sources of danger and we have been unable to obtain any prosecution due to the difficulties in obtaining evidence which will be accepted by a Court of Law.

The Committee has not had to call on its Wardens to take any direct action during the year, nor has the Committee received any report from its Wardens of breaches of the Protection Acts in their own areas. However the R.S.P.B. representatives on the Committee have all been extremely active and following their observations and reports much work for Protection and Conservation has been done.

Due very largely to the generosity of the R.S.P.B. who make only a nominal charge for the leaflets distributed to schools and those members who make regular annual contributions to the Committee's funds, the finances of the Committee are still sufficient for its needs at the present time and the balance in hand at the present time is £139 9s. 5d.

C. H. WILSON, Hon. Secretary.

ENTOMOLOGICAL SECTION MEETING

The Annual Meeting of the Entomological Section of the Y.N.U. was held in the Zoology Dept. of the University of Leeds on Saturday, 10th October. There were nearly 30 members present. Dr. H. Henson was re-elected Chairman. Mr. Peter Skidmore asked for personal reasons to be relieved of his duties as Hon. Sec. and Representative of the Section on the Executive and Fr. E. J. Pearce, C.R., was elected in his place to both offices. After the minutes had been read, the Chairman made some comments and suggestions, and a lively discussion on various matters took place. Mr. Crossley reported that no meeting of the Survey Committee had taken place. After tea, the following exhibited specimens: Mr. Aubrook (Coleoptera); Mr. Haxby (Lepidoptera); Mr. Flint (Diptera, Coleoptera and Hymenoptera); Mr. Jackson (Lepidoptera); Dr. Rees (a coleopteron); Mr. Skidmore (Diptera); Dr. Sutton (Isopods — with comments on two localities — Knaresborough and Spurn); Mr. Rutherford (Lepidoptera and Odonata and the MS of the first part of his "The Lepidoptera of Yorkshire — a commentary", with a total of 537 species, was on view); the Rev. E. J. Pearce (some Hemiptera, including a fine, large Coreidid from near Whitby); Mr. Winter (Lepidoptera). Reports on the various orders were made and membership of the three committees revised. Austwick Moss and Beckhead Wood were suggested for consideration as possible places for field-meetings in 1971.

E. J. PEARCE

SPRING FORAY, MIDDLESBROUGH, May 7-11, 1970

W. G. BRAMLEY

Cool but dry conditions favoured the spring foray with some ten people attending. We also welcomed Mr. C. Dickinson and students from Newcastle, and four or five local people who attended some of the excursions. Somewhat of an innovation was the first day's foray held at Peterlee outside the county. With the guidance of Mr. Monk of the Development Corporation, Castle Eden Dene proved to be the best collecting ground of the foray, whilst the cup of tea provided by Mrs. Monk at the end of the day was appreciated.

Unguicularia cirrhata was the most interesting find, but there is no doubt that many of these small discomycetes are passed over. Larger species included *Disciotis venosa*, two examples of the Morel, and a number of specimens of *Sarcoscypha coccinea*, a late date even for the north.

The rest of the meeting seemed to be spent in travelling from one locality to another, none of which equalled the Durham one, though Roxby Beck gave promise from the little time spent there. It is not often that in the workroom we are entertained by the trilling of canaries, the antics of a monkey or the silent gliding of fish. For this we were indebted to the Corporation of Middlesbrough and Mr. G. Watson, who had put a room at the Dorman Museum at our disposal.

Calospora innesii (*Calospora platanoides*) was very common at Ingleby Greenhow on *Acer* twigs over a good half mile, but no *Valsa* species, which is the opposite to most of my experience. Dr. Hering grew some in culture and produced a *Stagonospora*-like conidial stage. *Ditopa ditopella* was also abundant at the same place on *Alnus* to the exclusion of anything else on the several collections examined, whilst I have never seen such a profusion of *Dasyscypha clandestina* which covered Raspberry canes for feet, especially those which were more or less on the ground. It was also noteworthy that no *Melaconis stilbostoma* was seen on *Betula* in any of the localities visited.

C = Castle Eden Dene, Peterlee, Durham

H = Hutton Lowcross, Yorks.

I = Ingleby Greenhow, Yorks.

R = Roxby Beck, Yorks.

W = Wilton, Yorks.

DISCOMYCETES (W.G.B., T.H. & R.W.)

Apostemidium leptospora on *Corylus*, R.

Dasyscypha clandestina on *Rubus idaeus*, I.

Disciotis venosa, C.

Mollisia discolor var. *longispora* on *Bromus*, W.

Morchella vulgaris, C.

Pseudopeziza petiolaris, on *Acer* petioles, I.

Sarcoscypha coccinea, C.

Unguicularia cirrhata, det. W.D. Graddon, C.

PYRENOAMYCELES (W.G.B. & R.W.)

Apioporthes vespris on *R. idaeus*, I.

Calospora innesii on *Acer* twigs, I.

Cryptodiaporthes castanea on *Castanea* twigs, W.

Cucurbitaria spartii on *Cytisus scoparius*, H.

Ditopa ditopella on *Alnus* twigs, I.

Sordaria humana on Fox dung, C.

AGARICALES (R.W.)

Coprinus lagopides, W.

C. macrocephalus, W.

Psathyrella vernalis, C.

APHYLLOPHORALES (R.W.)

Ganoderma europaeum, C.

Odontia crustosa, C.

Peniophora lycii, C.

HETEROBASIDIALES (R.W.)

Dacryomyces lacymalis, C.

FUNGI IMPERFECTI (R.W.)

Thermomyces verrucosus on Fox dung, C.

BRYOLOGICAL WEEKEND AT INGLETON

12-13th September 1970

MARY DALBY and F. E. BRANSON

The first day of a successful weekend at Ingleton of the Bryological Section of the Y.N.U., was spent in Swilla Glen, penetrating as far as Pecca Bridge and back on the other side of the river Doe through Helk's Wood. This route provided a variety of habitats ranging from the limestone of the Glen itself to the old slate quarries, open turf with limestone and siliceous outcrops and finally to the limestone pavement of Helk's Wood.

In the Glen, the most interesting finds were *Pedinophyllum interruptum*, *Marchesinia mackaii*, *Seligeria doniana* and *Metzgeria pubescens* on the wet limestone rocks near the river. *Metzgeria conjugata* was also on these rocks. Mrs Gow found *Lejeunea ulicina* intermixed with *Metzgeria fruticulosa* growing on an ash tree by the river and Mr. Branson contributed *Cololejeunea calcarea*, *Distichium capillaceum* and *Trichostomum brachydontium* from the cliffs at the side of the Glen. He also found *Trichostomum crispulum* on a rock in the river. *Hypnum lindbergii* was recorded by Mrs. Shaw from the edge of the path.

The old slate quarry provided a new habitat; *Ptychomitrium polyphyllum* in fine fruit, *Polytrichum urnigerum*, *Tortula intermedia* and *Campylopus atrovirens* were found in rock crevices here. The outcrops produced *Frullania tamarisci* and *Rhacomitrium heterostichum* while the limestone pavement of Helk's Wood proved a rich habitat for such calcicoles as *Neckera crispa* and *Scapania aspera*. The *Thuidium* species produced some discussion but were finally identified as *T. tamariscinum* and *T. philibertii*.

On the second day of the meeting (Sunday) we visited Twistleton Glen. This Glen is the valley of the River Greta and is roughly one mile from Ingleton, whereas Swilla Glen (the valley of the River Doe) is approximately half a mile from Ingleton, both to the north. Along the approach to this Glen was a stone wall and there were a couple of quarries at the side of the path. These walls were most interesting and held a wonderful variety of rupestral species among which was a little of the thalloid hepatic *Reboulia hemisphaerica*. The moss *Barbula rigidula* was frequent and also a nice specimen of *Barbula reflexa*. In *The Mosses, Liverworts and Lichens of Yorkshire* (Part I, Mosses by Chris. A. Cheetham, Trans Y.N.U.) this latter species is said to be "Fairly common in the north-west on walls". I (F.E.B.) have personally not seen it in any other Yorkshire situation. On this wall was also a fine patch of the foliose hepatic *Barbilophozia barbata*. When we arrived by the streamside there was much of interest in the prolific display of bryophytes which exist in these situations. It was in this valley on 29th August 1963 that Mr. H. H. B. Birks recorded *Jungermannia lanceolata* with abundant perianths, and again, two patches of it on 1st Jan. 1966. This species was regarded as extinct in the British Isles. Unfortunately on this occasion we did not see the plant.

One of the good finds on this excursion was specimens of *Barbilophozia atlantica* which was collected by F.E.B. from the trunk of a living tree. This was rather an unusual habitat and the fact that it was growing in shade gave this small plant (which looks like a very diminutive form of *Barbilophozia floerkii*) an unusually green colour. A bank above the path at the side of the stream was rich in certain kinds of foliose hepatics, and there were large patches of *Bazzania trilobata*, *Mylia taylori* and *Lophozia incisa*.

Just off the path we discovered a delightful waterfall on the river, above which was a mass of *Hylocomium brevirostre*, a very attractive mountain moss, seen in its full beauty in its natural haunt and not as a dried up herbarium specimen! By the water *Heterocladium heteropterum*, a small juncaceous pleurocarp, *Dichodontium pellucidum* var *flavescens* with long, narrow, very jagged leaves, also a nice patch of the hepatic *Plagiochila spinulosa* were collected, and from another part of the Glen a specimen of *Andreaea rupestris* from a rock.

The complete list of species collected or noted is tabulated [below. Nomenclature follows *Census Catalogue of British Mosses* (3rd edition) by E. F. Warburg, and *Census Catalogue of British Hepatics* (4th edition) by J. A. Paton. We are most grateful to Mrs. J. A. Paton, Mrs. J. W. Fitzgerald, Mrs. J. Appleyard and Mr. F. A. Sowter for examining and giving their opinions on certain specimens and to other members of the Section for their records. In the following list S stands for Swilla Glen (44/67) and T for Twistleton Glen (44/77).

HEPATICS			<i>Ditrichum flexicaule</i>	S
<i>Reboulia hemisphaerica</i>		T	<i>Distichium capillaceum</i>	S
<i>Conocephalum conicum</i>	S	T	<i>Ceratodon purpureus</i>	S T
<i>Preissia quadrata</i>		T	<i>Seligeria doniana</i>	S
<i>Pellia epiphylla</i>		T	<i>Dicranella heteromalla</i>	S T
<i>P. endiviifolia</i>	S		<i>Dichodontium pellucidum</i>	S T
<i>Metzgeria furcata</i>	S	T	var. <i>flavescens</i>	T
<i>M. fruticulosa</i>	S		<i>Dicranoweissia cirrata</i>	S T
<i>M. conjugata</i>	S		<i>Dicranum majus</i>	S T
<i>Metzgeria pubescens</i>	S		<i>D. scoparium</i>	S T
<i>Prilidium ciliare</i>		T	<i>Campylopus fragilis</i>	S
<i>Blepharostoma trichophyllum</i>		T	<i>C. flexuosus</i>	S T
<i>Bazzania trilobata</i>		T	<i>C. atrovirens</i>	S
<i>Lepidozia reptans</i>	S	T	<i>Leucobryum glaucum</i>	S T
<i>Lophozia ventricosa</i>	S	T	<i>Encalypta streptocarpa</i>	T
<i>L. incisa</i>		T	<i>Tortula intermedia</i>	S
<i>Leiocolea muelleri</i>	S		<i>T. muralis</i>	S T
<i>Barbilophozia floerkei</i>	S	T	<i>Cinclidotus fontinaloides</i>	T
<i>B. atlantica</i>		T	<i>Barbula fallax</i>	S T
<i>B. attenuata</i>		T	<i>B. reflexa</i>	T
<i>B. barbata</i>		T	<i>B. rigidula</i>	S T
<i>Solenostoma triste</i>	S	T	<i>B. cylindrica</i>	S
<i>S. pumilum</i>	S		<i>B. recurvirostra</i>	S
<i>Nardia scalaris</i>	S		<i>Gymnostomum aeruginosum</i>	S T
<i>Marsupella emarginata</i>		T	<i>Eucladium verticillatum</i>	S
<i>Mylia taylori</i>		T	<i>Tortella tortuosa</i>	S T
<i>Pedinophyllum interruptum</i>	S		<i>Trichostomum crispulum</i>	S T
<i>Plagiochila asplenioides</i>	S	T	<i>T. brachydontium</i>	S
<i>P. spinulosa</i>		T	<i>Grimmia apocarpa</i>	S T
<i>Lophocolea bidentata</i>		T	<i>G. pulvinata</i>	S T
<i>L. cuspidatum</i>	S	T	<i>Rhacomitrium aciculare</i>	T
<i>Cephalozia bicuspidata</i>	S	T	<i>R. aquaticum</i>	S
<i>Diplophyllum albicans</i>	S	T	<i>R. heterostichum</i>	S T
<i>Scapania aspera</i>	S	T	<i>R. canescens</i>	S T
<i>S. nemorea</i>	S	T	<i>R. lanuginosum</i>	T
<i>S. undulata</i>	S	T	<i>Tetraphis pellucida</i>	S T
<i>Porella platyphylla</i>	S	T	<i>Pohlia nutans</i>	T
<i>Marchesinia mackaii</i>	S		<i>P. wahlenbergii</i>	T
<i>Lejeunea cavifolia</i>	S	T	<i>Bryum pseudotriquetrum</i>	T
<i>L. patens</i>	S		<i>B. caespitium</i>	
<i>L. ulicina</i>	S		<i>B. argenteum</i>	S T
<i>Cololejeunea calcarea</i>	S		<i>B. capillare</i>	S T
<i>Frullania tamarisci</i>		T	<i>Mnium hornum</i>	S T
MOSSES			<i>M. longirostrum</i>	S T
<i>Sphagnum palustre</i>		T	<i>M. undulatum</i>	S T
<i>S. squarrosum</i>		T	<i>M. punctatum</i>	S T
<i>S. recurvum</i>		T	<i>Ptychomitrium polyphyllum</i>	S
<i>S. cuspidatum</i>		T	<i>Amphidium mougeotii</i>	S T
<i>S. capillaceum</i>		T	<i>Orthotrichum anomalum</i>	T
<i>S. plumulosum</i>		T	<i>Climacium dendroides</i>	T
<i>Andreaea rupestris</i>		T	<i>Neckera crispa</i>	S
<i>A. rothii</i>		T	<i>N. complanata</i>	S T
<i>Atrichum undulatum</i>	S	T	<i>Omalia trichomanoides</i>	S
<i>Polytrichum urnigerum</i>	S	T	<i>Thamnium alopecurum</i>	S T
<i>P. piliferum</i>	S	T	<i>Heterocladium heteropterum</i>	T
<i>P. juniperinum</i>	S	T	<i>Anomodon viticulosus</i>	S T
<i>P. formosum</i>	S	T	<i>Thuidium tamariscinum</i>	S T
<i>P. commune</i>		T	<i>T. philiberti</i>	S
<i>Fissidens taxifolius</i>	S	T	<i>Cratoneuron filicinum</i>	S T
<i>F. cristatus</i>	S	T	<i>C. commutatum</i> var. <i>commutatum</i>	S T
<i>F. adianthoides</i>	S	T	<i>Campylium stellatum</i>	T
			<i>Amblystegium serpens</i>	S T
			<i>Hygrohypnum luridum</i>	T

<i>Acrocladium stramineum</i>		T	<i>Pleurozium schreberi</i>	S	T
<i>A. cuspidatum</i>	S	T	<i>Isopterygium elegans</i>		T
<i>Isoethecium myurum</i>	S	T	<i>Plagiothecium denticulatum</i>	S	T
<i>I. myosuroides</i>	S	T	<i>P. succulentum</i>	S	T
<i>Camptothecium sericeum</i>	S	T	<i>P. undulatum</i>		T
<i>Brachythecium glareosum</i>	S		<i>Hypnum cupressiforme</i>	S	T
<i>B. rutabulum</i>	S	T	<i>H. cupressiforme</i>		
<i>B. rivulare</i>	S	T	var. <i>resupinatum</i>	S	T
<i>B. plumosum</i>	S	T	<i>H. cupressiforme</i> var. <i>ericetorum</i>	S	T
<i>Cirriphyllum piliferum</i>	S	T	<i>H. lindbergii</i>	S	T
<i>Eurhynchium striatum</i>	S	T	<i>Ctenidium molluscum</i>	S	T
<i>E. praelongum</i>	S	T	<i>Rhytidiadelphus triquetrus</i>	S	
<i>E. praelongum</i> var. <i>stokesii</i>		T	<i>R. squarrosus</i>	S	T
<i>E. swartzii</i>	S		<i>R. loreus</i>		T
<i>E. riparioides</i>		T	<i>Hyclocomium brevirostre</i>		T
<i>E. murale</i>	S		<i>H. splendens</i>	S	T
<i>Pseudoscleropodium purum</i>	S	T			

BOOK REVIEWS

Natural History of the Lake District edited by G. A. K. Hervey and J. A.G. Barnes. Pp. 230 with 8 colour and 24 black and white plates, 20 text figures and end-paper maps. Frederick Warne & Co. 1970. £3.00.

One of the virtues of this book is that it provides an admirable survey of the geology, botany and zoology of the Lake District while at the same time serving to influence opinion through its unobtrusive yet persuasive contribution to the call for conservation.

The sections on geology and the different groups of plants and animals are all contributed by experienced naturalists with intimate knowledge of the area. The account of the plants, insects and birds is in each case based on habitat. Macan's account of life in the water, covering flatworms, molluscs, leeches, crustacea, insect larvae and fish is a *tour de force*. Who else could have done this single handed? It is full of interesting information and bears the stamp of a scientist steeped in his subject. But what is "lakewort" (p. 86), and did glaciation "culminate" 20,000 years ago as stated on p. 22 or had the ice "largely disappeared" at that time as stated on p. 90? The chapters on birds and mammals have a sound historical and ecological perspective. There are interesting parallels with north-east Yorkshire in the apparent temporary extinction of the badger and with Yorkshire generally in the spread of Roe Deer and the human predation of Otters.

The good impressions of the text are enhanced by the excellent photographs. The book is well indexed, is provided with a list of relevant reference books and papers, and also a useful account of the functions of various organisations with natural history interests in the Lake District. Its merits will doubtless assure it a ready sale and one hopes that its readers will not only profit from the information it contains but will also be converted by its message of the dangers ahead if active steps are not taken to safeguard the beauty and preserve the wild life of one of the best-loved and most visited parts of this country.

W.A.S.

The Oxford Book of Wild Flowers: Pocket Edition by S. Ary and M. Gregory with illustrations by B. E. Nicholson. Pp. 222 with 104 pages of drawings. Oxford University Press. 1970. £1.25.

This pocket edition of the larger work contains 550 coloured illustrations of wild flowers. The arrangement is by flower colour and the short, non-technical descriptions are in all cases placed on the page facing the illustration. There are also numerous black and white drawings of additional species or of fruits or other characters of importance for recognition and of the summer and winter outlines of trees. Sedges, rushes and grasses are excluded. The colours are occasionally misleading (e.g. Yellow-wort) but in general are satisfactory and the book can be recommended as very suitable for a beginner.

Collins Guide to Tree Planting and Cultivation by H. L. Edlin. Pp. 349 with 59 photographic illustrations on 24 plates and 80 text figures. Collins, 1970. £2.10.

Trees, Woods and Man by H. L. Edlin. Third Edition. Pp. xvi + 272 with 27 colour and 30 black and white photographs and two line drawings. Collins, *New Naturalist Series*, 1970. £2.25.

The first of these books by an acknowledged forestry expert is notable for its comprehensive nature. Every aspect of selection, cultivation, maintenance, propagation or removal is well covered. It is a book for the town or country gardener as much as for the forester, with much useful advice on what, where, how and when to plant, on such peripheral topics as legal liabilities for tree problems which give rise to disputes between neighbours or damage by falling trees and a multitude of other subjects. How many people know for instance why oak trees are more often struck by lightning than beech trees? The second part of the book deals with individual tree species, native and exotic, planted in this country. This includes not only the taller forest trees, both broad leaved and conifers, but small trees, shrubs and hedge bushes. There are also appendices in which information is given about arboreta open to the public, journals and other sources of information relevant to the subject, and a very useful appendix on trees to choose and to avoid for particular soils and situations, for autumn colouration, smoke or salt spray resistance etc. In short this book does for the tree grower what the best of the available guides do for the grower of herbaceous border or alpine plants.

The fact that *Trees, Woods and Man*, which was originally published in 1956, is the only volume of the *New Naturalist* series to reach a third edition, is sufficient evidence of its worth and success. The present edition is substantially unchanged but some interesting figures are given of the remarkable increase in the total extent of British woodland during the 15 years since the first edition appeared. These show that conifers account for nearly three-quarters of Britain's productive woodlands, that the total area of woodland has risen by a million acres in the last 23 years and the current rate of increase is some 70,000 acres annually despite losses to agriculture and building.

Both books are generously illustrated, the monochrome photographs of the first being much more pleasing than the low quality colour photographs which are the weakest feature of the second book.

W.A.S.

Drawings of British Plants: Part 27, Ulmaceae to Pinaceae by Stella Ross-Craig. Bell & Sons Ltd., 1970. 80p.

The first part of this work appeared in 1948. The present part represents a milestone on the long road to its conclusion for in it the drawings of Dicotyledons are completed. The present part contains 46 plates including drawings of three Gymnosperms – juniper, yew and Scots pine – interpolated, somewhat surprisingly, between the Dicotyledous and Monocotyledous. In all, 1,138 plates have now been published in the 27 parts issued.

The present part includes the amentiferous families Ulmaceae, Cannabinaceae, Urticaceae, Myricaceae, Betulaceae, Corylaceae, Fagaceae and Salicaceae, together with Empetraceae and Ceratophyllaceae and the three aforementioned Gymnosperms. Six elms are figured but only two poplars, *P. tremula* and *P. nigra*. The illustrations of the two birches both show smooth twigs without hairs or resinous warts. The drawings of the 18 species of willows probably constitute – along with those of the elms – the most useful part of the issue. These drawings are all beautifully executed though that of *Salix herbacea* implies that the dorsal surfaces of the leaves are as rugose as those of *S. aurita* or *S. reticulata*; one misses also the persistent, partly-decayed, previous-season's leaves on the shoots of *S. myrsinites* which form such a distinctive feature of that species. But one would like to think that the artist is aware of the goodwill of all subscribers to this series of fine drawings and how much all are hoping that nothing will stand in the way of its completion in the reasonably near future.

W.A.S.

A Key to the Nymphs of British Species of Ephemeroptera with Notes on their Ecology by T. T. Macan. Second, revised edition. Pp. 68 with 37 figures. Freshwater Biological Association Scientific Publication No. 20. 1970. 35p.

The high quality both of the key and the accompanying illustrations to all the British species of Mayflies make this an indispensable work for laboratory taxonomists and freshwater students in the field. The principal change from the original edition (reviewed in *Nat.*, 1962: 69) consists of a page and a half of addenda relating to more recent observations on the biology and life history of some of the species.

Innocent Killers by **Hugo and Jane van Lawick-Goodall**. Pp. 222, with 33 black and white photographs. Collins, 1970. £2.25.

This is a most interesting book containing a great deal of original work. To this extent I am in whole-hearted agreement with the publisher's blurb though I am not so sure that it "reads with the pace and vividness of a best-selling thriller", as they also claim. The innocent killers are Wild Dogs (The Cape Hunting Dog of many African works), the Golden Jackal and the Spotted Hyena. They are killers without doubt; a sort of second tier of predators by African standards. The larger predators are to appear in a second volume, by the same authors, in due course.

The three studies are highly personalised accounts of the behaviour of the three species, but the wealth of new (i.e. newly interpreted) information presented and the superb back-up photographs will make this book something of a landmark in its field. I do not see the need for the elaborate defence of the subjects which the authors rather labour – image-building to live down the "unsporting" way in which these animals hunt. At one stage in the book the reader is virtually invited to choose between a ten minute suffocation by Lion or a two minute disembowelment by Wild Dog. It would be a difficult decision to make. Presumably this approach is directed at those who destroy Wild Dogs, Jackals and Hyenas as they themselves hand out instant death in the course of their safaris.

This however is a minor quibble; I am sure that many people will want to read this book and in so doing will find themselves appreciating the subjects for their marvellous adaption to their way of life, the intricacies of their social behaviour and their roles as ecological entities in the East African biotope.

The authors took their young son along too, and he takes a considerable part in the book. The van Lawick-Goodall's family album must now be of more than usual interest for compendia of that sort.

The production of the book is excellent, the end paper maps helpful and there is a selected bibliography with suggestions for future reading. Let us now sit back and wait for volume two – The Stealthy Killers.

T.M.C.

Wild Deer in Britain by **Roy A. Harris and K. R. Duff**. Pp. 112, with a coloured frontispiece and 110 black and white photographs. David and Charles, 1970. £2.50.

This is a very slim volume and a relatively high-priced one too. However, it is something of a miracle of compression in which rather more than thirty-five pages of text and over a hundred photographs are presented without skimping on space for either.

The deer species covered include the native Red and Roe, and the introduced Sika, Fallow, Muntjac and Chinese Water Deer; in other words, those living wild or feral in Britain today. I was sorry that the Reindeer was not included; it has historical grounds for inclusion, even though the Cairngorm herd is managed at present. The text of this book should not be under-rated, it gives a good introduction to the life history, identification, sporting significance and so on of each species. It is the gallery of photographs however which are likely to sell the book. Taken as a whole they are excellent and, more than that, they are helpful.

If you ever see deer or are likely to see them, and there are around 500,000 living wild in Britain today, then you will appreciate this book. Deer management and conservation, legislation and recent research, are all covered too. Definitely a book that one can recommend to a wide readership of naturalists and country-users.

T.M.C.

The Wild Mammals of Malaya by **Lord Medway**. Pp. 127 with fifteen coloured plates and eleven text figures. Oxford University Press, 1970. £6.25.

Malaya, even including the offshore islands and Singapore, is not overburdened with mammal species. This book does more than justice to its subject and will no doubt give impetus to mammal studies on the Peninsula.

One hundred and ninety nine species, ranging from Elephant to Savi's Pigmy Shrew, are covered, with identification data and brief life histories. The concise style of the latter are models of brevity and yet have a high degree of readability. In the discussion on family characters a great deal of useful information is given, ranging from trapping baits to diets in captivity for the rodents. The layout of the book too is worthy of praise as are the colour plates by Mazli Matsom and Hamidah Suhaimi. One does not have to contemplate a trip to Malaya to enjoy this book. A book on European mammals on the same lines would indeed be welcomed.

T.M.C.

The World of the Jaguar by **Richard Perry**. Pp. 168, with one colour and 11 black and white photographs. David and Charles, 1970. £2.25.

Richard Perry, working his way through life histories of the great mammals of the world, has arrived at the Jaguar. The result is a comprehensive review of what is known of one of the world's mysterious mammals. From distribution and hunting techniques to relations with Man and even supernatural affinities he delves into the life of his subject. South America is a continent of mystery, with big snakes, outlandish mammals and a great deal of difficult terrain. In some ways the Giant Anteaters, Tapirs and Capybaras come across better than the main subject of the book. Jaguar stories are legion, facts are comparatively scarce.

If only by underlining the mysterious nature of "El Tigre" Richard Perry has done a good service with this work. T.M.C.

A Field Guide to the Butterflies of Africa by **John G. Williams**. Pp. 228 with 283 coloured and 425 black and white illustrations. Collins, 1970. £2.25.

Collins' series of Field Guides and Pocket Guides have set a high standard and this is no exception. The illustrations, particularly in colour, are clear and the text is concise with an indication of range, habitat and time of appearance; in some cases the food plant is given but larvae are not described. There is good cross-referencing between the plates and the text. The book is concerned only with species occurring south of the Sahara; it is not for the British lepidopterist holidaying in North Africa or the Canaries! The region is known to have 2,400 species and the author deals with only 436 of these, with a pronounced preference for the bigger species so that he can spare only two plates for the Blues and a passing reference for the Skippers.

A useful guide to the more conspicuous butterflies that the visitor is likely to encounter. I wish I had had it when I visited Kenya last year, it would have added greatly to my interest. C.I.R.

Bryozoans, by **J. S. Ryland**. Pp. 175 with 21 text figures. Hutchinson University Library, London, 1970. 70p.

This is an excellent little book and a welcome addition to a very useful series. Bryozoa are an isolated group, as unusual in their development as in their adult structure and with no clear affinities to the great phyla, so that they have been somewhat neglected by all but specialists and a good introductory study had become a real need. They present problems of great interest also to workers in very diverse fields and a notable achievement of the author has been to identify this audience and to maintain a satisfactory balance between their different requirements. In particular can be mentioned problems of distribution and adaptations to different conditions, of colony formation and some very puzzling questions of co-ordination and communication, of marine fouling and of pollution, of stratigraphy and other aspects of invertebrate palaeontology. In this last instance there is an interesting chapter in which the characteristics of a living order are used to interpret the fossil remains of three extinct orders. In sum, the text contains a great deal of information presented in a succinct but readable form, the text figures are admirably clear and the extensive bibliography includes a useful indication of the contents of each of the works quoted. T.K.

The World of Ants by **Remy Chauvin**, translated by George Ordish. Pp. 216 with 42 black and white figures and 8 pages of photographs. Victor Gollancz, 1970. £2.40.

This is a well-written, interesting, and informative book. No major inaccuracies have been detected. The translation has been very skilfully done. The chapter-headings indicate its scope: the ant as a friend of man; other, more or less likeable ants; the ant's herds; city life; the vices and enemies of the city; social relations; the brain and senses of ants; conclusion. There is a satisfactory index. Some of the text-figures are somewhat "smudgy". One of the worst offenders in this respect is fig. 1., dealing with the heads of a number of ants, where clarity was specially needed. There is one omission: while *Lomechusa* is mentioned (p.134) as affording "perhaps the only known case of drug addiction among animals" (is this really so?), there is no reference to *Claviger* and its allies. The book is strongly bound and the print clear and attractive, matching a lucid and pleasing style which is never dull. E.J.P.

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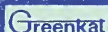
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THE NATURALIST

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THE YORKSHIRE NATURALISTS' UNION

Y.N.U. NEWSLETTER

The Y.N.U. Newsletter, sent to all Full members and Affiliated Societies, is published three times a year: February, May and November. Its aim is to provide a means of intercommunication between all members by giving, for example, reports on Y.N.U. and Society meetings and activities, items of broad Natural History interest, details of all types of surveys and enquiries. All items should be sent to the Newsletter Editor: Mr. H. T. James, 238 Sigston Road, Beverley, Yorks.

ENTOMOLOGICAL SECTION: FIELD MEETING

Sunday, 27th June — Ashberry Pastures. Meet 11.0 a.m.
(O.S. map sheet 92 Grid Ref. 569846)

BOTANICAL SECTION: FIELD MEETING

Sunday, 4th July — Ashbury near Rievaulx. Meet at 10.30 a.m. in the car park at Sutton Bank top.

YORKSHIRE NATURALISTS' UNION ADMINISTRATIVE OFFICER

Will members please note that the newly appointed Administrative Officer of the Union is Mr. Frank J. Thompson, 18 Stepney Road, Scarborough. Phone Scarborough 60243.

Mr. Thompson is undertaking duties formerly performed by the General Secretary and the Asst. Treasurer and Membership Secretary.

R. CROSSLEY, *Chairman, Executive Committee*

CORRECTION Will members please note that the date of the Hovingham meeting should read Saturday 26th June — not 6th June as printed on the circular.

NEW *The Lives of British Lizards* a field study by Colin Simms, B.A., F.L.S., Deputy Curator of the Yorkshire Museum. 8½ in by 5½ in., 128 pages, 24 illustrations 4 in colour. Price £2.75 (Postage and packing 13p). Obtainable from your bookseller, or Goose & Son, Publishers, 23 Davey Place, Norwich, NOR 38E

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INSECTS IN THE CHANGING YORKSHIRE SCENE

J. H. FLINT

*Presidential Address to the Yorkshire Naturalists' Union, Leeds,
5th December 1970*

I selected this title and subject because I think European Conservation Year is a particularly suitable time for taking stock of the natural history of our county and of our activities as naturalists. I am speaking about insects but I hope that something of what I have to say will be of interest to a wider audience because it may have a more general application. The Yorkshire scene has always been changing. It has changed slowly over the centuries as nature has responded to man's activities. In the past twenty-five years, however, with the aid of machinery and chemicals, man has been able to produce changes in land use much more rapidly and much more thoroughly, so the process of change has greatly accelerated. In her Presidential Address to the Yorkshire Naturalists' Union last year Miss Rob spoke of the changes in the flora occasioned by the changing methods of farming. The changes in the insect population over large parts of the county have been equally drastic. Agriculture and the spread of housing, industry and roads have all contributed to the factors that have brought about these changes. Although man is responsible for the physical changes that are most immediately apparent, it should not be forgotten that most habitats, those that we call natural, are usually in the process of change. Left to themselves, the scrubby slopes eventually become woodland and the old cattle ponds become choked with vegetation and slowly change to marsh. These changes can be seen over a period of ten or twenty years but some changes are much slower and may not readily be noticed.

Some changes in insect populations can be measured by reference to changed conditions in our daily lives. I will pass by the fleas and bed-bugs because I trust that at no time did they form part of the daily experience of this audience, but in the 1930's, when I was a boy in Armley, my home which was just over two miles from the centre of Leeds was invaded every summer by houseflies. There were certainly two species, the common housefly (*Musca domestica* L.) and the lesser housefly (*Fannia canicularis* L.). *M. domestica*, the larger of the two, was particularly attracted to food; *F. canicularis* was addicted to flying in intricate patterns of circles below the light in the centre of the room. Both were equally unwelcome visitors. We had no effective means of discouraging them so we hung sticky flypapers from the light to trap them and reduce their numbers. In the immediate post-war years we had the same problem at my present home in Chapel Allerton, although I think the numbers were smaller — and here you see that I have no systematic way of measuring this — and we sprayed the rooms with D.D.T. which was moderately effective. For many years now we have not needed sprays, houseflies seem to be uncommon visitors, and for us at least, flypapers have become part of our social history. We do not have far to look for the reason. In Armley there were four dairy farms within half a mile of the house. The farmers delivered milk to the houses using horses to draw their milk carts through the streets. The cattle deposited plenty of dung in the fields, and in one case in the road through the streets. There were reeking manure heaps outside each set of farm buildings and good, rich muck over all the farm yards. The farmers catered generously for the larvae of the houseflies and they thrived. Now all this has changed. A power station stands on the fields of one farm, housing covers the fields of two others and the fourth has become parkland and a golf course. Major breeding haunts of the housefly have been destroyed in Armley. In Chapel Allerton, the only dairy farm that was near my home has also gone and the houseflies have been reduced in numbers.

I am starting with this very obvious example because much of our information about changes in insect populations is based on subjective impressions that are hard to confirm by reference to any recorded facts about numbers. This particular case is supported by factual evidence, the absence of the flypaper and the insect spray. The effect can be seen and the cause is obvious. That the numbers of blue-bottle flies (*Calliphora* spp.) and green-bottles (*Lucilia* spp.) have also decreased near my home is a subjective impression because the only measurement of quantity that I have is a memory of the numbers of corpses of trapped flies that used to adorn the windows of grocers' shops. Before the war there always seemed to be a profusion, now there are relatively few. Changed shop layout and more vacuum cleaners might be responsible, but I think there has been a real decline in numbers in this particular district. I think there has been a decline, a more recent decline, in the same district in the number of hoverflies

(*Syrphus* spp.) and droneflies (*Eristalis* spp.) and this seemed to me quite striking during the past summer when, unfortunately, I had to spend far too many sunny afternoons waiting in my garden for the insects to come to me. They did not come in any number. I cannot recollect how many hoverflies I could see in the garden simultaneously in, say, 1950. But I can remember, as a boy, collecting without difficulty, by hand, sufficient droneflies in about fifteen minutes in the garden to cause a very pleasant interruption to a fourth-form mathematics lesson when they were released from the confinement of matchboxes. My son could not have repeated that misdemeanour with droneflies from my garden this year.

I am in no doubt in the case of the Chimney-sweeper moth (*Odezia atrata* L.) in Roundhay Park. In certain parts of the park the grass was allowed to grow long and was then cut and carted for hay. On sunny evenings in late May numbers of Chimney-sweepers, in company with clouds of grass moths (*Crambus* spp.), flew up as one walked through the long grass, as they did in all the meadows around Leeds. Now the grass is cut short regularly and the Chimney-sweepers and most of the grass moths have largely disappeared. Here the cause and effect are quite obvious.

I have selected these examples because, although I have no records of quantities of houseflies, blue-bottles, hoverflies or Chimney-sweepers, personal recollection of particular conditions and circumstances allows me to make the statement that in these particular districts there are fewer of these insects than formerly. Neither my personal records nor those of the Yorkshire Naturalists' Union would support statements that compared the numbers of common insects that are to be found now and that were to be found thirty or forty years ago. We just do not keep such records. We know that bumble-bees (*Bombus* spp.) were common insects. We know that bee-keepers have reported catastrophic losses in some parts of the country due to the application of insecticidal sprays, and that bumble-bees and other insects in the afflicted areas must have suffered along with the hive-bees. We still consider bumble-bees to be common in Yorkshire but we do not know whether or not they are as numerous as they were thirty years ago. In general, we are not keeping any notes now that would help to assess changes in the next thirty years and this may be something to which we should turn our attention. On the Hetchell Wood Nature Reserve, near Leeds, although I have nothing more reliable than personal recollection I believe that the numbers of bumble-bees have declined. In the fields immediately surrounding the reserve the land is much more intensively farmed than formerly and it is possible that I infer a decline because conditions have changed.

We may find it difficult to assess the scale of change in the countryside as a whole, but we can be sure that where a habitat has been destroyed the population that formerly lived there will have been destroyed also. To build a motorway, power station or housing estate clearly destroys the countryside that is engulfed, but the effects of farming and forestry can be no less drastic and they are very much more widespread. On good agricultural land there has been a steady destruction of hedges as small fields are merged into larger units. Field boundary hedges are replaced by post and wire fences, or narrow, clean ditches or even not marked at all. Permanent meadow and pasture go under the plough and the glory of the golden buttercup fields that provided amply for the hosts of bees, sawflies, flies, beetles and butterflies is replaced by a uniform green grass that provides the farmer with a better return, and us with more food, but which is a barren desert for those insects that need nectar to fuel their flight muscles. To make full use of the land, the farmer ploughs margins that previously were neglected. May I quote a short passage from a book which inspired me when a boy and which I still consider the best introduction to the study of beetles, "Common beetles of our countryside" by W. E. Sharpe. His style was romantic and here the passage is abridged. "Let us . . . discover if we may, one of those quiet grassy lanes, which, slipping unobtrusively from the motor-haunted high road (the date is 1915!), wind their devious way for miles among the fields, sometimes leading by a stile-path to some remote village or debouching finally on some distant high road. . . . The nature lover delights in these secluded byways, their untrimmed hedgerows, their deep over-grown ditches and wide margins of fern and gorse and holly. . . . These afford a refuge and a sanctuary for beast and bird and insect." It was not difficult in the 1930's to find such lanes within easy reach of Leeds, and, as Sharpe wrote, the entomologist, after discovering such a lane, could expect to spend many afternoons there, with the capture of many beetles, before its possibilities were exhausted. The lanes still exist, but often the hedges have been removed, the ditches cleaned and the adjoining land ploughed to the edge of the track. The lane is a sanctuary no longer.

This, then, is part of the changing scene, the part that affects the numbers of those species that we generally regard as common. It is not a total change over the whole of the county but is a process that is continuing. It can be seen particularly on the Plain of York, on the East Yorkshire Wolds, on the Magnesian Limestone belt of the West Riding and on the other areas of rich agricultural land. But the agricultural lowlands are not the only areas where the scene is being changed. The North Yorkshire moorlands have come under heavy pressure from forestry. Conifer plantations have covered many thousands of acres of once open moorland. Other parts of the moors have been ploughed and seeded with grass to improve pasturage for sheep. These practices are drastically changing the fauna that inhabited these areas, and the steady, continued encroachment must ultimately restrict the moorland fauna to isolated pockets in nature reserves and areas where the physical contours are so steep that cultivation, by forest or by pasture, is uneconomic. In the Pennine hills, the rough grazing has been improved by extensive drainage in many parts and here the changes are not so dramatic in appearance and their effect on the insect population is not obvious.

The insects that interest most amateur entomologists are those that are not commonly found. That expression is chosen deliberately. Many insects are considered to be uncommon simply because we do not use the right techniques to find them. These techniques may be discovered by accident. Two beetles that are widely distributed in Yorkshire are the cockchafer (*Melolontha melolontha* L.) and the little chafer (*Serica brunnea* L.). Both are found occasionally during the day, the time when most coleopterists are active, but over a period of thirty years only one cockchafer had been found at Hetchell Wood, and that in 1941. In 1969 a start was made on the systematic recording of the night-flying moths on the Reserve and an ultra-violet lamp was used to attract them. In September of that year the little chafer came to light in numbers; the cockchafer came in the same way during the following June. There can be no doubt that both are well-established residents on the Reserve that are not revealed by the normal collecting methods of the coleopterist. Their presence in quantity was revealed by chance and, the technique for collecting them being known, if sought, they could both prove to be much more common than the present records would indicate.

The uncommon insects that concern us most are those that need a special set of circumstances in their habitat if they are to survive. In general they are to be found on ground that has not been greatly disturbed over centuries or which has changed slowly. Such habitats are to be found where land has not been economic to farm, old woodland, marsh and bog, heathland and steep slopes. This is the type of land that has come under increasing pressure in recent years as the owner, quite naturally, seeks to derive some profit from it and it is the destruction of these special habitats which causes us most concern. This concern, of course, is not limited to entomologists but is shared by all naturalists.

When we come to assess the changes that have taken place in the status of the uncommon insects in Yorkshire we are hampered, not only by the nature of the records at our disposal, but also by their number. We must take into account the relative paucity of entomologists compared with the size of the county and the number of insect species. Each year sees many more species added to our county lists but most of these additions are of small and inconspicuous insects, members of families that have not received much attention before. Many insects are difficult to find. To locate the adult one must be at the right place, at the right time of the year, possibly at the right time of day and in conditions that suit the insect and permit the entomologist to use his apparatus. If the insects are rather thin on the ground, and moving, the paths of the entomologist and the insect must meet. A daunting combination of circumstances and one which explains why reports from Union field meetings can be so poor even when entomologists are present. The result is that it might still be true to say that in spite of all the work that has been done over the past hundred years our knowledge of the distribution of the best-known insects is rather sketchy and that for most insects the best we have is a number of scattered records from which distribution can be inferred.

It is tempting, in the case of the best known insects, the butterflies and moths, to assume that additions to the county list are likely to be recent arrivals in Yorkshire but this is by no means certain. Dr. S. L. Sutton found the Mere Wainscot (*Arenostola fluxa* Hubn.) at Pilmoor and near Aberford in 1968. It had not been taken in Yorkshire before. There are marshes in both places that were there before the Romans came and while the moth could be a recent arrival it seems much more probable that the specimens found were part of two isolated relict populations previously undiscovered. It is possible

to distinguish several beetles that are recent arrivals in Yorkshire. Two examples are the ground-beetle *Feronia angustata* Duft. and the ladybird *Harmonia quadripunctata* Pont. *Feronia angustata* was first reported in Britain in the south-east in 1916. It established itself and subsequently spread north. In 1939 it was found in South Leeds and has since turned up in several places in the West Riding. It favours burnt ground. On the edges of woodland it may be found where the forester has had a large bonfire and mosses are just beginning to colonise the ground again. When the woodland grasses ultimately cover the ground the beetle vanishes. It will colonise areas of bare ground that have not been burnt, rubbish tips, spoil heaps and so on. It must be highly mobile and may be considered one of the insects that have succeeded in exploiting features of our changing landscape. *Harmonia quadripunctata* is a more recent arrival in Britain which was first noticed in Yorkshire in 1966. It is an inhabitant of larch (*Larix decidua* Mill.) plantations and as it has now spread to several parts of Yorkshire, increasing afforestation is likely to help it. Unlike the sawflies that also can exploit the new forests, the ladybird is entirely beneficial and a welcome immigrant.

A much less conspicuous beetle, but one that is easily located, is *Cis bilamellatus* Fowl. a tiny Australian which has become established in the old, dead birch-bracket fungus (*Piptoporus betulinus*), a niche which it has virtually to itself. By 1964 it had spread as far north, in the eastern half of the country, as Scarcroft, near Leeds, and Strensall Common. Its haunts are easily seen and examined and at that time it did not appear to have passed northwards beyond these limits. In this case, the statement is supported by the evidence of many habitats examined without result, not the usual negative evidence of "no records". We are on much less certain ground (or water) when we consider the records of the water-beetle *Ilybius subaeneus* Er. Balfour-Browne considered this beetle to be extending its range up the eastern half of the country and it was first found in Yorkshire near Selby in 1954, subsequently at Haw Park, near Wakefield, in 1967 and in a cattle pond at Sicklinghall in 1968. However, in cases such as this one can never be sure how far the absence of records simply reflects the absence of previous chance encounters and recognition. The beetle may have been present, unnoticed, for many years.

A beetle which could be considered to have spread in recent years is *Hylecoetus dermestoides* L., a conspicuous beetle with a distinctive larva that tunnels into dead, but solid, tree trunks and branches. Until recently it was only known in Yorkshire from the Helmsley district and it was always considered to be a rare insect. Then, in 1963, colonies were found near Holmfirth and in Roundhay Park, Leeds. In 1965 it turned up at Newmillerdam and subsequently has been taken on Strensall and Skipwith Commons. None of the localities where it has been taken in these last few years has suffered any great change and the beetle could have been there all the time. Even though three generations of competent coleopterists have collected in Roundhay Park, this prize could have eluded them. The probability is that the beetle, which flies strongly, is quite widely scattered over the whole of lowland Yorkshire and the records do nothing more than list the chance encounters of insect and entomologist.

Changes which involve the disappearance of species are not easy to prove but in some cases are quite clear. The glow-worm (*Lampyris noctiluca* L.) was frequently seen in the North Leeds area a hundred years ago but there are no reports in this century. We can be quite sure that it died out and that it disappeared before any of the changes in farming practice could have affected it and before housing spread to its haunts. We have no knowledge of the reason for its disappearance. Similarly we can be sure that the Small Blue butterfly (*Cupido minimus* Fuess.) does not live any longer in the Wetherby district although at the turn of the century it was reported to be quite common there. We do not know, however, if it had been long-established at Wetherby, or whether it appeared suddenly and, like the Bedstraw Hawk moth (*Celerio galii* Rott.) in the Leeds area, flourished for a few years and then vanished again. Our records are not sufficiently detailed.

We should not look upon change in the countryside as something entirely harmful, although it is difficult often enough to see any cheerful aspect. Paradoxically, change is a constant factor in our countryside. It can be seen in operation and its effects can be recorded. This is particularly easy in aquatic habitats. Although the rivers and larger beckes tend to maintain themselves in a state of equilibrium, many of our ponds and ditches have been made by man and must be maintained by him if they are to survive. When they are neglected, vegetation grows strongly from the margins and ultimately open water becomes marsh and may even dry out completely. One of the most notable

and best documented habitats in Yorkshire is Askham Bog, the main surviving part of what was once extensive fen and bog. What remains is the Reserve administered by the Yorkshire Naturalists' Trust and a few outlying fragments in Acomb. The main haunt of the water-beetles in the nineteenth century seems to have been Challoner's Whin ponds but these no longer exist. Almost half the total of British water-beetles had been found in this area. In 1881, Fowler described the Bog as a number of ponds edged with deep moss. He was referring, almost certainly, to Challoner's Whin. By the turn of the century the mossy edges had largely vanished and the ponds steadily deteriorated. When I first knew them in the 1940's they were not very attractive; by 1968 they were not worth visiting. In the part which is now the Reserve the water-beetles and other aquatic insects continued to flourish in the deep drains that surround the Bog. In the early 1950's the large *Dytiscus dimidiatus* Berg. was still there and the most notable of the remaining fenland water-beetles, *Agabus undulatus* Schr., was still so numerous that it was possible to find twenty specimens in the net at once. The ditches were, of course, man-made and man-maintained. They provided an ideal habitat for the *Agabus*. Now, alas, they have been polluted and when last my son and I visited them in 1969 there were very few water-beetles of any sort and those that we could find were the common species that quickly colonise any new water, beetles that had literally dropped in when flying by and which had not yet taken off again for more salubrious parts. One very small colony of *Agabus undulatus* remained of the multitude that had existed fifteen years before. This is a sad tale, but it is one that could be told of other places. It is part of the effect of man on the environment. It is quite clear that the original area of the Bog has been steadily reduced since the days of its glory in the nineteenth century (we have no records of its beetles in earlier times). The establishment of the Reserve might well have saved what was left of the special aquatic fenland fauna but the pollution was just the last link in the chain of destruction. The special fauna, of which *Agabus undulatus* is an example, cannot re-establish itself even if the pollution ceases and the water becomes clean again. Unlike most other British water-beetles, it does not fly. It has wings but no effective flight muscles. It could not colonise ponds away from the Bog and so has no local bases from which to return and it lacks the ability to do so even if it had such bases.

Some changes are immediately catastrophic to the habitat affected. Such was the destruction of a series of connected ponds, if we can call them ponds, on the site of the old ammunition works of the 1914-18 war at Barnbow, Leeds. The ponds were similar to some of the mill-lodges of the West Riding, brick-walled but shallow, with a depth of perhaps a foot of water over a soft clay bed. Four particularly notable insects were quite common there, a water-beetle called the "Squeaker" (*Hygrobia hermanni* F.), another, *Oreodytes halensis* F., and two water-bugs, *Cymatia bonsdorffi* Sahl. and *C. coleoptrata* F. None of them has been found elsewhere in this part of Yorkshire. The Squeaker is a conspicuous beetle and could not possibly have been over-looked by the collectors who have recorded water beetles over the county. The ponds were artificial but they provided exactly the type of silt bottom that I found the Squeaker to prefer at Kilnsea (in an old bomb crater) and in Essex (in cattle ponds). As the ponds did not exist before 1914 the beetles must have arrived since that date and they could not possibly be considered the remnant of a once more widely distributed population in the area such as may have been the case with the Mere Wainscot. The ponds were destroyed during opencast mining operations and the beetles were obliterated. Unlike *Agabus undulatus*, these beetles can fly and colonise and a question remains, from whence came the original colonists? Possibly there are other, undiscovered, colonies in West Yorkshire.

Only occasionally do we have a reasonably connected series of observations which record the actual changes. Askham Bog is such a case, but a happier one relates to an area where my primary concern was the ground-beetle genus *Bembidion*, most of which are associated with damp places, the sides of ponds, lakes and rivers. In Golden Acre Park, on the north-western outskirts of Leeds, there is a lake. It was drained during the war and then allowed to fill again. The level of the water was lowered later to its present level, exposing on the north bank a bare gritty shore crossed by several small streams, mere trickles of water about an inch deep. By 1949 the damp areas had been colonised by several uncommon ground-beetles, among them *Bembidion obliquum* Stm. and *Acupalpus dorsalis* F. In 1951 there was a small colony of the green tiger-beetle *Cicindela campestris* L. on the drier parts of this area and larvae as well as adult beetles were found in May. In 1953 a strong colony of the water-beetle *Agabus paludosus* F. was found in one of the shallow trickles. None of these beetles is to be found elsewhere in the park or in the immediate vicinity. The tiger-beetle may have made the shortest

journey for the nearest colony is on Adel Moor, just a mile away, but the land between is quite unsuitable for the beetle. It is a strong flier, but its flights are usually quite short; twenty yards would be a long flight. The *Agabus* is a much scarcer beetle and quite distinctive in appearance and so not easily overlooked by coleopterists. In the West Riding it had been taken previously in the Doncaster area and at Knottingley. There is a record from Askham Bog which seems improbable, but, as I have said, the beetle is a distinctive one. Since 1953 a strong colony has been found on the uplands near Malham where a beck crosses a stony track, a typical habitat. Where did the *Agabus* come from to colonise Golden Acre? I mention these four beetles to indicate how a new habitat can be colonised by insects that are regarded as very local in their distribution. The habitat was produced by a change determined by man. Nature continued the change. The bare, sandy, gritty surface was steadily colonised by mosses, *Sphagnum*, *Polytrichum* and others. Sedges (*Carex* spp.) and many other plants established themselves and impeded the rapid run-off of the water that crossed the once bare area. The tiger-beetles could not survive in the increasingly wet conditions and they soon died out. Mosses choked the little stream and the *Agabus* departed. Other insects have moved in but the rate of change is now much slower and less easy to appreciate.

Change is taking place within our cities as well as in the countryside. As in the country, it is taking place more rapidly than in earlier years. In Leeds, the war interrupted a major policy of slum clearance, leaving large areas in the centre of the city derelict. As far as it was able to do so, vegetation covered the rubble-strewn land where slum houses stood formerly. This new habitat was colonised by many insects. A survey of the beetles of these cleared sites, within a mile radius of the city centre, was begun in 1947 and 49 species of beetle were found. Most of them were common species, the species that are common because they are such good colonisers. Most of them, but not all, were winged and known to be strong fliers, such as the dung-beetles of the genus *Aphodius*, the rove-beetles, *Philonthus* and *Oxytelus*, and the ground-beetles of the genus *Amara*. No fewer than eight species of *Amara* were found, most of them in numbers for the dry brick rubble and cinders provided an ideal habitat for them. Some were quite uncommon beetles. A disused static-water tank, with perhaps a foot of water remaining, contained the very uncommon *Rantus pulverosus* Steph. and the not particularly common *Ilybius fenestratus* F. *Rantus* had been recorded in ponds at Moortown, a few miles to the north, in 1921, but nowhere else in Yorkshire since that date. *Ilybius* had been recorded from Meanwood, a few miles to the north-west. The insects on this derelict land had several years in which to establish themselves. Now the pace of change is so much faster and land is cleared and rebuilding takes place after a much shorter interval. It may not be profitable any longer to study the fauna that has so short a time to establish itself on these cleared sites in the centre of cities, but this example will serve to show how insects will move into an area when there is a change in land use. The insects are moving about all the time. Where conditions are suitable they will stay and breed.

All this poses problems for the entomologist — and opportunities for absorbing work in the field. It is not my purpose this afternoon to deliver a requiem for the departed insects. Change will continue and nature reserves can only provide isolated pockets in which we may hope to conserve fragments of communities that once were more abundant and widespread. To maintain even these populations it is essential that entomologists take a full share in the task of conservation. It is not sufficient to see a reserve established if subsequent management, or neglect, destroys the habitat that supported the insects we wish to protect. It was unfortunate that at Askham Bog clearance of the scrub removed the colony, the only known one in the Bog, of the longhorn-beetle *Saperda populnea* L. This could have been prevented had the information been available to the Management Committee. *Mea culpa*.

In the vicinity of our towns, planning authorities have left little islands of woodland or other open space as places of recreation. Initially they may be little nature reserves but lack of management usually destroys their value as such. Roundhay Lime Hills, Leeds, is an example. Housing surrounds this once famous locality but the trees of the woodland have been left standing. Recently a search for the small but distinctive rove-beetle *Siagonium quadricorne* Kby. was unsuccessful although the beetle had been quite common there in the 1940's. *Siagonium* lives under the bark of dead and dying elder trees (*Sambucus nigra* L.) when these are infected by the Jews Ear fungus (*Auricularia auricula* Hook). There had always been plenty of dead and dying elder of suitable size so I was astonished by its almost complete absence in 1969. The woodland was almost

devoid of dead timber which could be moved. The reason seems quite clear. Surrounded by houses and a large population of children, this wood must be the first target for chumpers every November and elder is the softest and most easily removed of the trees and bushes. So, although the locality has been preserved, the habitat for *Siagonium* has been destroyed.

Even when a locality is being managed as a nature reserve it is important that the claims of conflicting interests should be made plain to the management committees. An important part of the management of chalk and limestone slopes, from the botanists' viewpoint, is the grazing of the turf so that coarse grasses are kept in check and the typical flora of sheep- and cattle-cropped grassland is maintained. But the Marbled White butterfly (*Melanargia galathea* L.), now reduced in Yorkshire to a very few isolated colonies on the Wolds, flourishes only where the grasses are long and coarse, anathema to the botanist. It is essential for the survival of such colonies that these conditions are maintained.

There remain wide areas of Yorkshire still to be explored by entomologists but many of these are distant from the main centres of population where most of the entomologists live. There is plenty of scope for work in the immediate environs of the towns and cities, on spoil heaps, abandoned railway cuttings and embankments, rubbish tips, old quarries, canals and streams and in many municipal parks where the gardeners have not reduced everything to neat lawns and flower beds. Many of these habitats are in the process of change, sometimes fast, sometimes slow. Some, as may be the case in the Dearne Valley, are remnants of old bogs and marshes, still there because no-one has yet found it profitable to drain the land. Old populations can still linger on, possibly thrive, in the least salubrious surroundings. New populations will certainly move in as conditions change. I hope that entomologists will work these areas, record adequately what they find, and see that their records are made available for the benefit of other present, and possibly even more important, future entomologists.

EXCESSIVE ABUNDANCE OF *HYPONOMEUTA EVONYMELLA* (L.) (LEPIDOPTERA: HYPONOMEUTIDAE)

GEOFFREY FRYER

Although *Hyponomeuta evonymella* (L.), one of the so-called "Microlepidoptera", is known at times to increase in numbers to epidemic proportions, specific instances tend to go unreported and the following observations, relating to a particularly dramatic case, are therefore placed on record. This species is usually plentiful in South Westmorland and adjoining parts of North-West Yorkshire and North Lancashire where its food plant, the Bird Cherry (*Prunus padus* L.), is common and widespread. Casual observations made in this area over the past few years indicate a gradual increase in abundance of this insect, whose larvae make conspicuous communal webs on the trees and bushes which they inhabit and are therefore readily perceived. No quantitative data have been obtained to substantiate this assertion but the increase has probably been continuous since 1965 and culminated in cases of complete defoliation in 1970.

The normal practice of the larvae is to construct a communal web which encloses a number of leaves and under whose protection they live and feed in groups which may number several hundreds. Within these webs the larvae pupate in clusters, usually during the latter part of June, and the adult moth emerges later in the same year. Five or six years ago in the Kentmere valley (Westmorland) certain regularly observed trees generally bore several such discrete webs, always well-dispersed throughout well-leaved hosts. During 1968 and 1969 colonies were more abundant than in the immediately preceding years and at the end of the feeding period defoliated portions of colonised trees were of frequent occurrence. Only in 1970, however, were completely defoliated trees and bushes seen. No such had been seen during the previous ten years of residence in the area. In this year the effects of *H. evonymella* were often dramatic. Not only small bushes but in some cases trees at least 20 feet in height were completely stripped of foliage and, instead of covering isolated groups of leaves or small branches, the larval web covered the entire tree, including the main trunk. Such trees were conspicuous from a considerable distance, being as naked as in winter but with every branch encased in a shining silver web. Furthermore, in some cases starving larvae emigrated from the host tree onto surrounding vegetation over which they spun webs. In the Kentmere valley

not only were adjoining branches of Hazel and Sycamore so covered, but the larvae moved over and completely enveloped a number of herbaceous plants, including in one case ferns as well as angiosperms. Above Dent (W. Yorks.) larvae left a completely defoliated hedge some 20 yards in length and spun extensive webs over an adjoining dry-stone wall.

In the Kentmere valley, Hazel and Sycamore had been nibbled, but to a very small extent, and on some trees many larvae undoubtedly starved. In early June hundreds were crawling both inside and outside the web which encased the trunk of one tree and eagerly swarmed over and began to devour leaves of *Prunus padus* supplied from a less heavily infested tree nearby. Within minutes such leaves were enveloped by a seething mass of larvae which crawled over each other in their efforts to reach this source of food. Leaves of Ash were also supplied but were completely ignored.

Towards the end of June, and following rain, the shining silver web that encased every branch of this particular tree was showing signs of wear. In spite of the enormous number of larvae previously present only 7 clusters of pupae could be seen. One of these was taken. Associated with it were several larvae which had congregated to pupate but which failed to do so and eventually died on the webbing near the pupal cluster. Although no counts were made (and such would hardly have been feasible) it is certain that great mortality occurred.

The limits of the region affected by heavy infestations have not been ascertained and even within a localised area the degree of infestation varied from tree to tree, defoliated examples sometimes being located near to less heavily infected hosts. Complete defoliation was, however, observed in the Kentmere and Troutbeck valleys and between Kendal and Tebay (Westmorland), between Sedbergh and Kendal (Yorkshire-Westmorland border area), and in Dentdale, from Sedbergh to above Dent (Yorks.). In Deepdale (off Dentdale) infestations seemed generally to be lighter than in Dentdale but even here some trees would have attracted attention in "normal" years.

That the vast increase in numbers of *H. evonymella* was also associated with some dispersal was evident from events taking place on two adjacent host trees inside, and a third on the fringe of, a much observed tract of mixed woodland at Windermere. No colony of *H. evonymella* had previously been seen on any of these oft-noticed trees but in 1970 each bore several colonies. It was on one of these trees that the only evidence of predation on the insect was obtained. In early July a Coal Tit (*Parus ater* L.) was seen pecking at, and presumably extracting pupae from, a piece of webbing which it eventually wiped from its beak onto a branch, to which it adhered. Insufficient observations were made to test the belief that completely web-covered trees are unattractive to birds but, in view of the number of birds feeding young at the time, any heavy exploitation of larvae crawling conspicuously on the outside of the webs might have been expected to be seen — unless birds were surfeited. As it was the only bird seen to perch on such a tree was a Chaffinch (*Fringilla coelebs* L.).

Whether a major crash in the population of *H. evonymella* occurred in 1970 or whether sufficient larvae pupated on heavily infested but not completely defoliated trees to ensure further heavy infestations and defoliation in 1971 remains to be seen. Whichever alternative materialises, however, the prediction made by William Curtis as long ago as 1782 for the Brown-tailed Moth (*Euproctis chrysorrhoea* (L.)) will no doubt ultimately apply. This moth, whose larvae also produce webs, reached epidemic proportions near London in 1781 and 1782. As Curtis pointed out in *A short history of the Brown-tailed Moth*, an acute food shortage would certainly be experienced after three successive years of increasing abundance. Because of this many larvae would fail to mature and numbers would thereby be regulated. Almost two centuries later we are, however, still to a large extent obliged to concur with Curtis who adds that "What the actual causes are which occasionally produce these extraordinary quantities of insects will, perhaps, for ever remain among the arcana of nature".

Although almost certainly as a result of entirely different factors it may be recorded that larvae of the Antler Moth (*Charaëas graminis* (L.)) were abundant in parts of the northern Pennines in both Westmorland and Yorkshire in 1970, so much so that newspapers reported "plagues" of caterpillars consuming grazing which normally supported sheep. By contrast *H. padella* (L.), a close relative of *H. evonymella*, which feeds on Hawthorn and which often strips hedges in Norfolk, was reported by E. A. Ellis in the "Country Diary" of *The Guardian* for 9th July 1970 to be "quite scarce this year".

I am grateful to Mr. J. Heath for information relating to *Hyponomeuta*.

THE VEGETATIVE CHANGES ON ILKLEY MOOR

M. DALBY, J. H. and A. FIDLER, and J. E. DUNCAN

The first detailed description of the vegetation of Ilkley Moor is contained in F. A. Lees' appendix on the flora in *Ilkley, Ancient & Modern* published in 1885. Here crowberry (*Empetrum nigrum*) is described as growing "on the peaty edges of the dykes and amid heather on Rombalds Moor", and heather (*Calluna vulgaris*) itself is described as "plentiful". Most of the plants mentioned in this book as growing on the Moor have been found during this survey, although such species as bogbean (*Menyanthes trifoliata*) and marsh cinquefoil (*Potentilla palustris*) survive only as nonflowering remnants in a very few places. Butterwort (*Pinguicula vulgaris*) was reported in 1946 and a single plant found in 1960, but has not been recorded since. True casualties from this list include mountain cat's ear (*Antennaria dioica*), sheep's bit (*Jasione montana*), butterfly orchid (*Platanthera bifolia*) and staghorn clubmoss (*Lycopodium clavatum*).

Smith and Rankin's work on the vegetation of the Pennines in 1903 shows from the maps that Ilkley was predominantly a heather moor, interrupted only by two areas of cotton-grass bog on the Greengates and Crawshaw areas, and by "grass with heath" covering the lower slopes. This picture is very different from that portrayed by our distribution maps of the communities (*Nat.* 1970, 41) compiled just 60 years later. The heather will be seen to have retreated to the higher parts of the Moor, bracken has encroached upon most of the lower slopes, and in its phenomenal increase, crowberry has invaded every community and now virtually dominates the Moor.

In this paper, which forms part of a series published by the Wharfedale Naturalists' Society during their ten year survey of Ilkley Moor (*Nat.* 1961, 37; 1963, 41; 1963, 43; 1963, 127; 1969, 53; 1970, 41), our chief interest has been to study and try to measure the changes that have taken place since 1960.

METHODS USED

During 1961 permanent transects were located in various parts of the Moor and re-examined after an interval of 5 to 8 years. The method used depended on the extent of the area to be examined.

Along transects over small, well-defined areas such as the *Sphagnum* or *Molinia* bogs a point quadrat frame was used, recording the species present at each 5 cm. point across the entire area. In more extensive areas the transect was divided into a series of one or three metre lengths and the percentage cover of each community was calculated in each length.

A version of the point quadrat method was evolved to cover a wide area of cotton-grass bog where it was required to measure the infiltration of crowberry. 12 to 20 people were stationed at measured intervals along one side of the area to be studied and each walked to his marker at the far side, thus making a number of parallel tracks. At every fifth step a record was made of the plant underfoot, but for simplicity the presence or absence of crowberry was the only thing recorded. In effect the whole area was covered by a number of transects, the method of recording being that of the point quadrat on a large scale where the 5 pace length intervals represent the 5 cm. lengths of the first method. On an outline plan of the bog the line for each individual was plotted and the records spaced out to allow for differences in length of stride. It was possible to shade in the areas where crowberry was present at more than 50% of the steps recorded.

This method of "mass survey" was also used to assess the status of crowberry where it was competing with heather.

CROWBERRY INVADING PEAT

Detailed ecological study of the manner of growth of crowberry on the Moor was the subject of a paper in *The Naturalist* 1961, 37, where it was estimated that unimpeded shoots could grow up to 12 in. annually. The area chosen to demonstrate crowberry's rate of growth was a north-facing slope at an altitude of 1050 ft. near Black Beck (G.R. 44/096466) with a peat depth of 22-30 cm. This area had previously been covered with bracken (*Nat.* 1963, 41).

In 1961 there were numerous small round colonies of crowberry scattered over the area separated by wide expanses of bare peat. The percentage cover of crowberry in two 28 metre transects was estimated as follows:

	<i>Transect A</i>	<i>Transect B</i>
1961	32.9%	30.9%
1965	92.9%	95.9%

This large increase in four years represented diagrammatically in Fig. 1a-1b, illustrates the extraordinary spread of crowberry when conditions are favourable.

A second area examined in 1961 was Bare Hill (G.R. 44/099462) where the transect passed from complete cover to almost bare peat except for minute plants of heather, a few colonies of crowberry and the moss *Orthodontium lineare*. Over a 25 metre transect the percentage was as follows:

	Bare peat	Crowberry	Heather
1961	63.8%	16.8%	4.6%
1969	10.8%	66.4%	13.8%

In 1969 the moss had disappeared and most of the heather plants were small, scattered and almost engulfed by the crowberry. Fig. 2 shows the change in crowberry cover. An interim examination in 1964, when the percentage of crowberry cover had risen only to 28% and the heather remained virtually unchanged, shows that the most rapid change here has been within the last 5 years.

CROWBERRY INVADING COTTON-GRASS BOG

Two areas were chosen; one of limited extent, the whole width of the bog being covered by a 58 metre line; the other, very much more extensive, in the Greengates area, covering several acres. The former (44/125463) lies in a hollow on the plateau above Rocky Valley at an altitude of 1050 ft. and has a depth of peat varying from 4 cm. at the edges to over 75 cm. in the centre. The percentage cover (Fig. 3) was as follows:

	Cotton-grass	Crowberry	Sphagnum
1961	72.0%	15.8%	5.0%
1969	38.1%	61.9%	—

In 1969 the *Sphagnum* and open pools had entirely disappeared along the transect line. Again there is a marked increase of crowberry and a corresponding decrease of cotton-grass.

Measurement of the Greengates area in 1962 and 1966 was by mass survey as described above. At first glance in 1966 this area still appeared to be cotton-grass bog until closer examination revealed the insidious invasion of crowberry creeping over the tussocks. The results are shown in the diagrams (Fig. 4). The shaded areas contain over 50% of crowberry and show the invasion spreading into the centre of the bog from the sides. The depth of peat averages 45 cm., the deepest part being 75 cm. near the centre of the area.

CROWBERRY INVADING MOLINIA

There are few extensive areas of purple moor grass (*Molinia caerulea*) on the Moor. The area chosen lies at an altitude of 850 ft. behind the Hangingstones quarries (44/128466). Here the peat is nowhere more than 22 cm. deep and varies very little in depth. Change at this site was assessed by recording the plants every 5 cm. along a 78 metre line across the bog. The results (Fig. 5) were as follows:

	Crowberry	Molinia	Cotton-grass	Cross-leaved heath
1961	34.66%	46.53%	0.53%	3.53%
1969	49.26%	28.0%	5.6%	8.53%

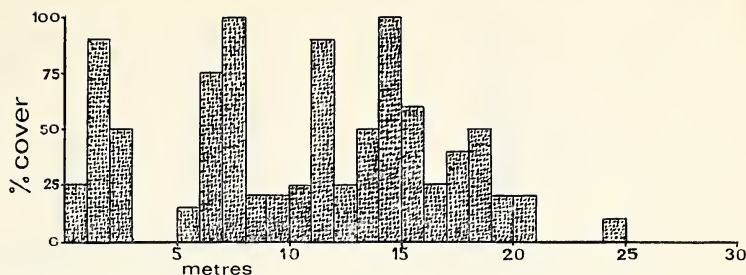
Of the other species noted, *Sphagnum* remained at 2%, heather, wavy hair-grass and bilberry at 1% and the bryophytes noted in 1961 (*Gymnocolea inflata*, *Orthodontium lineare*, *Polytrichum commune*, *Drepanocladus fluitans*, *Campylopus piriformis* and *Cephalozia bicuspidata*) had virtually disappeared in 1969 from an estimated 3.73% in 1961. It is of interest to note that in 1969 no single metre length across the bog was without crowberry.

SPHAGNUM BOG

Two sites were chosen but one had unfortunately to be abandoned in 1969 because of drainage operations carried out in the spring. However, thanks to the co-operation of Ilkley U.D.C. this bog has now been restored to its previous condition, and it is hoped to be able to continue work on it in due course.

The other site lies at an altitude of 875 ft. below Barmishaw Hole (44/113467), 34 metres in width and is surrounded by dense stands of bracken. The peat depth varies from 30 cm. at the edges to a fairly uniform depth of 60 cm. for most of its area. The bog remains constantly very wet.

1961



1965

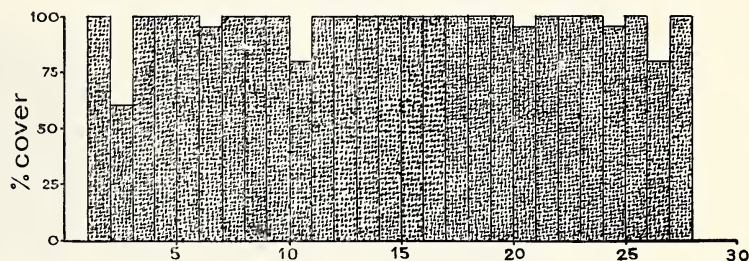
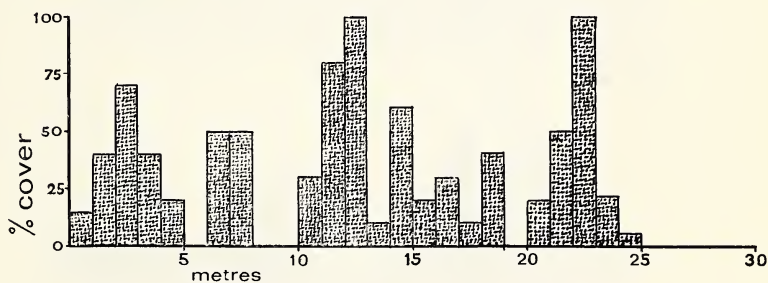


Fig.1 a Empetrum invading bare peat. Increase of Empetrum from 32.9% to 92.9% in 4 years

1961



1965

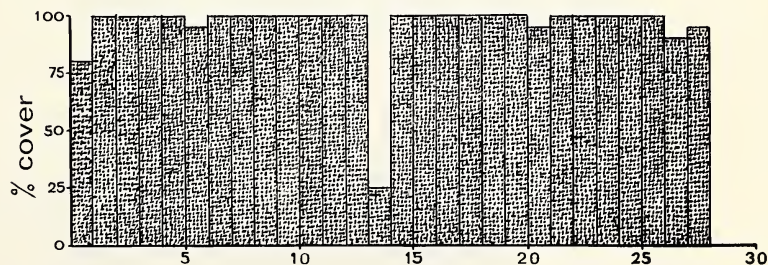


Fig.1 b Empetrum invading bare peat. Increase of Empetrum from 30.9% to 95.9% in 4 years

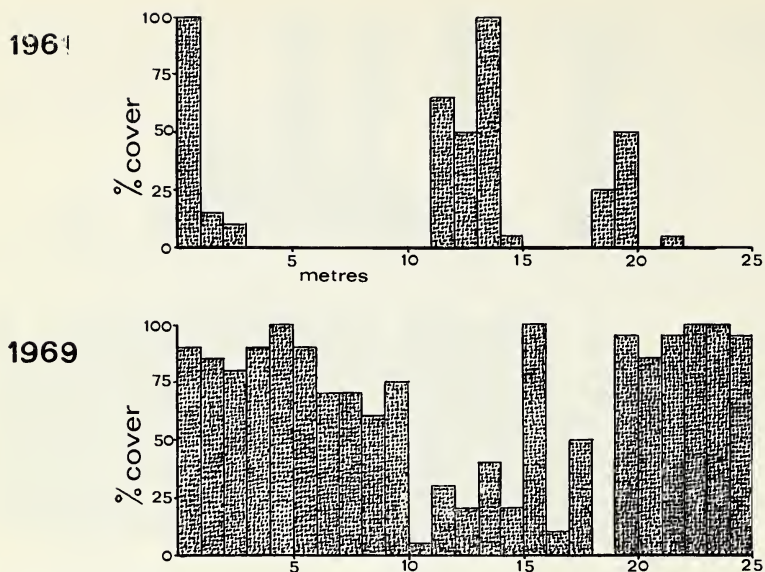


Fig. 2 Bare Hill, showing invasion of *Empetrum*.
16.8% to 66.4% in 8 years

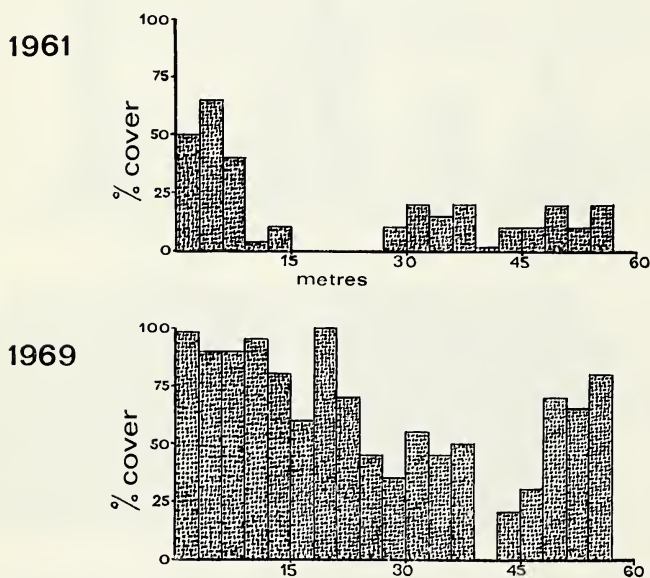


Fig. 3 Cotton grass bog, showing invasion of *Empetrum*. 15.8% to 61.9% in 8 years

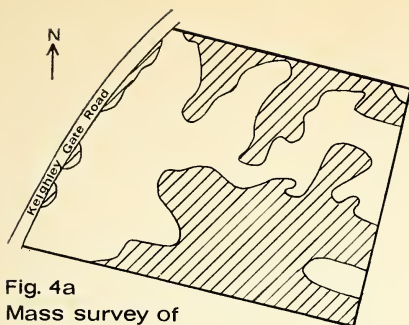


Fig. 4a
Mass survey of
Greengates area 1962, showing
invasion of *Empetrum* (shaded)

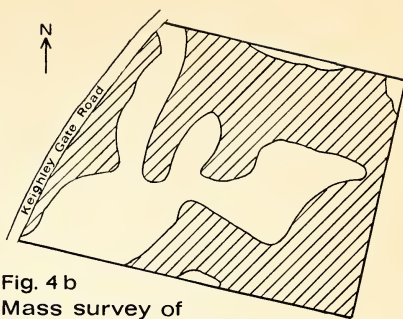


Fig. 4b
Mass survey of
Greengates area 1966, showing
invasion of *Empetrum* (shaded)

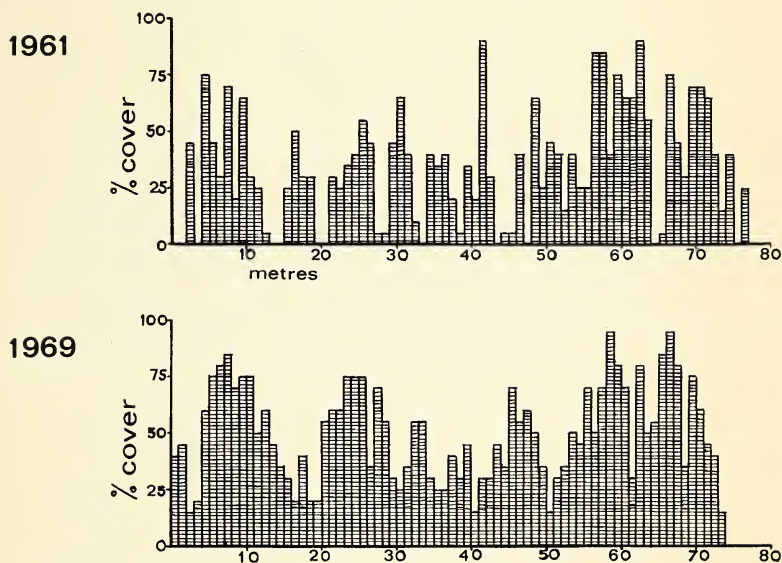


Fig. 5 *Molinia* bog. Increase of *Empetrum* from 34.66 % to 49.26 % in 8 years

The point quadrat method was used with 5 cm. intervals along the transect across the bog. *Sphagnum* comprised almost 50% of the cover, the rest being composed of crowberry, many-headed cotton-grass (*Eriophorum angustifolium*), cranberry (*Vaccinium oxycoccos*), bog violet (*Viola palustris*), tormentil (*Potentilla erecta*), pennywort (*Hydrocotyle vulgaris*), rushes (*Juncus effusus*, *J. bulbosus*, and *J. acutiflorus*), grasses (*Holcus lanatus*, *Nardus stricta*, *Agrostis tenuis* and *Deschampsia flexuosa*) and the moss *Polytrichum commune*. Virtually no change has taken place during the eight years from 1961, except that crowberry has invaded on the eastern side, its percentage cover having increased from 6.0 in 1961 to 15.9 in 1969.

HEATHER

The study of heather on the Moor spans the whole period of the survey up to the time of writing.

The first piece of ecological work was done in 1959 at the Burley end of the Moor where there is a fence between Burley Moor and Hawksworth Moor. At this place there had been an accidental fire three years previously and it was observed that the growth of vegetation on the Hawksworth side of the fence, inaccessible to sheep, was much more extensive than that on the Burley side where sheep are allowed to graze.

Three line transects 2 feet long were established at typical places:

- A. the area fenced against sheep
- B. wet, unfenced area
- C. dry, unfenced area

Transects A and B were equidistant from the fence on either side and C was further away on slightly higher ground. The heights of the plants growing at 1 inch intervals were measured. The average height of the heather plants were as follows:

- A. 7.3 inches
- B. 1.6 inches
- C. 2.2 inches

For many years Ilkley Moor has been grazed by sheep. The Moor is Common Land with no stint, therefore grazing has been intensive and because sheep have been the sole domestic animal present grazing has also been selective, certain plants suffering more damage than others. Because of their mode of growth the shoots of grasses are protected and are not destroyed by sheep-grazing but the growing shoots of heather are unprotected. Frequently whole young heather plants are pulled up and left lying on the ground, not bitten off cleanly as in the case of grass. Heather plants on heavily grazed areas are short, generally about 2 inches high, with flowers stunted or absent except where protection is provided. Such heather, surrounded by crowberry before being smothered by it, will often flower freely as sheep avoid the crowberry. It is this selective grazing by the sheep which enables crowberry to flourish at the expense of heather.

Most of the bare peat is quickly recolonised by seedlings of heather whose numerous seeds are dispersed by wind. If sheep are absent or few in number these plants will be able to compete successfully with crowberry which, as a bird-dispersed plant, never produces vast numbers of seedlings although its vegetative proliferation is rapid.

The area chosen to demonstrate any change in the heather community was Shepherds Hill at the extreme western end of the Moor where the Urban boundary joins Addingham Moor Side. Heather is abundant on the Addingham side of the boundary but decreases quickly on the Ilkley side. The grid reference is 44/0846 and the area is covered by shallow blanket peat. A mass survey of this site, carried out as described for the Greengates area, was made in 1963 and 1969. The results are shown in the charts (Fig. 6) and indicate no appreciable change.

In our article on the plant communities of Ilkley Moor (*Nat.* 1970, 41) heather is shown as a dominant community only on the upper plateaux in the Burley and Addingham areas of the Moor. It would appear that the decrease of heather following the 1903 report took place before this survey — indeed, this was largely the reason for starting it — and it is our impression that this year, 1970, heather is increasing on the Moor.

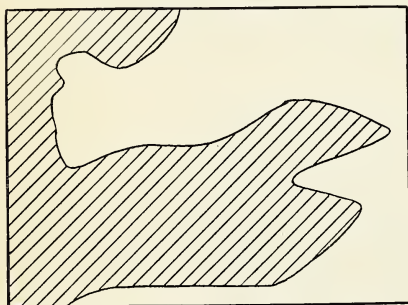


Fig.6a Mass survey of Shepherds Hill area 1963.
Calluna shaded

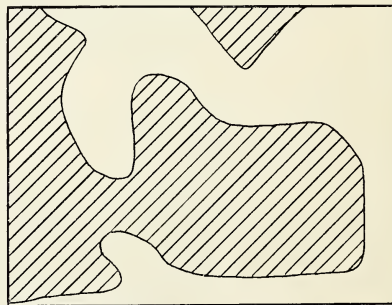


Fig.6b Mass survey of Shepherds Hill area 1969.
Calluna shaded

BURNED AREAS

During the dry summer of 1959 there were several accidental fires on the Moor, some of which remained smouldering in the peat for several weeks. One such fire below Barmishaw Hole (G.R. 114467) in an area of tumbled boulders was examined the following spring, when a probe revealed a depth of 50 cm. of dry ash before the soil began to cake in the hand, whereas under the surrounding cover of crowberry and bilberry soil caked at 6 cm. The ash of the burnt patch was blowing badly when sheep crossed. This area has been recolonised by bracken growing in from the edges or from colonies where the rhizomes were protected by boulders, but still remains an open community 10 years later. Another small area (G.R. 145455) burnt in 1959 has still been recolonised only by the mosses *Polytrichum juniperinum*, *P. piliferum* and *Orthodontium lineare* with a few sparse colonies of wavy hair-grass and sheep's sorrel.

In contrast, an extensive fire in June 1960 in an area above Rushy Beck (G.R. 1345) took place during a dry month but was followed by a very wet July, thus allowing almost immediate regeneration to occur. This fire did not penetrate deeply into the peat.

More detailed study has been carried out on an extensive area to the N.W. of the Cow and Calf Rocks (G.R. 128464), burnt in 1959. All vegetation, except for a narrow strip from E. to W. across the centre, and one or two small patches of bracken on the S.W. edge of the area, had been destroyed. The central strip contained plants of crowberry, mat grass, heath rush and bracken. Burning was deep and the soil was reduced to a black, powdery ash several inches in depth. The ground remained in this condition for two years after the fire. During this time the ash was considerably eroded by wind and rain, exposing less deeply-burned reddish soil and many stones. The area remained almost completely barren, the only vegetation being small seedlings of grass and rush which appeared close to the surviving vegetation. After a long spell of wet weather two species of moss (*Ceratodon purpureus* and *Polytrichum piliferum*) established a firm hold in many places and the tufts of grass and rush were larger, more numerous and widely scattered. With the consolidation of the soil by the mosses and the increase of moisture caused by a series of cool, damp summers and wet winters vegetation increased slowly, regeneration taking place chiefly by seed. Mat grass and heath rush, present in the central strip, were the first to establish themselves, and by 1969 had become the dominant species, with wavy hair-grass as the next most frequent species. There were many plants of crowberry and a few of heather but the mosses had almost entirely disappeared. Bracken still grew only on the edge of the patch and had not increased. A general view of the burnt patch in 1969 suggested a fairly complete cover of vegetation, but a closer look revealed plants growing in clumps separated by bare and stony ground showing that even after ten years the damage caused by deep burning to the vegetation of this fairly elevated and exposed area of the Moor had not been made good.

TREES

Pollen analysis and the visible remains of trees buried in the peat of Heber and Crawshaw Mosses indicate that areas of the Moor were once covered by birch scrub. Now, apart from the occasional isolated holly, hawthorn or rowan, the only trees on the Moor are a series of seven plantations, dating from the 1870's, ranged along the lower escarpment and consisting of Austrian and Scots pines, larch, birch and rowan. There are also deciduous trees planted round the Tarn.

During the severe gales of 12 and 16 February 1962 the conifer plantations suffered badly. A total of 314 trees were destroyed, two thirds of them uprooted, the others broken off leaving less than one third of the tree. Sheep grazing prohibits any natural regeneration of these plantations so that, apart from the damage done by gales, it is probable that they will decrease.

DISCUSSION

The most significant change on the Moor during the period of this survey has undoubtedly been the extent to which crowberry has increased, both in colonising bare peat and in its invasion of certain communities. The reasons for this increase are more difficult to assess and we can only speculate on the importance of the following:

1. *The effect of sheep grazing.* Selective grazing by one species of domestic animal inevitably means that the unpalatable plants flourish at the expense of the palatable, a process which will snowball, because as the palatable plants decrease the pressure of grazing increases. Crowberry is unpalatable and sheep will not eat it, whereas heather, bilberry, young shoots of cotton-grass and even *Molinia* and young matgrass are eaten when more palatable plants fail. During and after the two world

wars the pressure of sheep grazing was increased but during the last few years pressure has decreased and there is some evidence that some species, especially heather, are increasing. It is noticeable that on Hawksworth, Bingley and Addingham Moors, where grazing is restricted, heather is much more extensive and robust.

2. *The effect of climate.* Although the rainfall measured in the town at Ilkley for the 10 years between 1959 and 1968 remains at an average of 35.24 inches, similar to the previous 10 year cycle, there is a range of rainfall from 43.83 ins. to 25.64 ins. The years from 1959 to 1964 average only 31.12 ins., the last four years average 41.39 ins. Even though these last few years have been wetter than normal it is our impression that the Moor is drying out. Our evidence for this is that many pools and open patches of water have disappeared in the smaller bogs, and it may be that the mode of growth of the crowberry, producing its own detritus, (*Nat.* 1961, 37), has the effect of raising the level of the vegetation. The changes have been greater where the peat is shallow. Crowberry, although we have found it growing in wet *Sphagnum* bogs, prefers dry peat and it may be that the series of dry years at the beginning of this survey enabled it to gain a foothold in the normally wetter areas.

3. *The effect of Man.* During the dry summers accidental fires expose areas of bare peat where heather and crowberry seedlings appear as soon as conditions are favourable. Where grazing is heavy the heather seedlings are quickly grazed whereas crowberry, being unpalatable, has no such handicap and flourishes. A number of drainage channels have been dug through many of the smaller bogs and as they dry out crowberry invades.

This report is the result of 10 years work on the Moor recording the changes which have taken place in the vegetation. It may be of interest to note that although in some cases, notably the heather survey, there has been no appreciable change in the total cover there is variation in the pattern of cover. This is also noticeable in the Greengates survey of crowberry. Whether this is due to ageing of the plants or to some other cause could open up further channels of investigation.

ACKNOWLEDGEMENTS

Our thanks are due to Dr. Bartley of the Botany Dept. of Leeds University, to Dr. Sledge, Editor of *The Naturalist*, and above all to our fellow members of the Wharfedale Naturalists' Society who have co-operated with us to produce the data for this paper.

Yorkshire Flooding — Some Effects on Man and Nature by J. Radley and C. Simms, with a Foreword by Peter Scott. Pp. 28 with 10 figures. Ebor Press, York. 1971. 50p.

This booklet gives much historical information about the major floods which have occurred on the Ouse and its tributaries from 1315 to 1968. Their more spectacular effects, the havoc created and the recorded heights to which the waters rose make interesting reading. The practice of digging grips on the peat moors to facilitate run-off is regarded as a major contributory cause of present-day flooding and despite modern control measures periodic heavy flooding in the future is "confidently predicted".

The second part dealing with the effects of floods on the flora and fauna is largely based on observations carried out over a wide area during and after the heavy flooding in March 1968 when water levels at York rose by more than 30 feet. The disturbance caused to wild life yielded many interesting records. Water Rail and Reed Bunting were seen in considerable numbers. The former — considered a 'scarce' Yorkshire bird by Chislett — was seen even in the centre of York and ten pairs were located, two within the city boundary, after the floods had receded. Mink and Otter records were also augmented. The effects of flooding on plant life are illustrated by numerous examples of washdowns which temporarily colonised river banks and floodlands.

The report concludes with suggestions for the establishment of a regional wildfowl refuge in the lower reaches of the R. Derwent where, though permanent stretches of open water are few, the washlands regularly support a large population of visiting wild fowl.

A sombre note is added to this report, the theme of which centres round sudden and destructive events, by Jeffrey Radley's tragic death during his excavations of the City defences at York.

W.A.S.

AN ACCOUNT OF THE DEPOSIT OF SHELL MARL AT BURTON SALMON, WEST YORKSHIRE

A. NORRIS

Leeds City Museums

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In May 1969, Leeds City Museums were presented with samples of shell marl from a temporary excavation at Burton Salmon (SE 491 273), three kilometres (approximately two miles) north of Ferrybridge. The samples contained appreciable numbers of the lamellibranch *Pisidium pseudosphaerium*, a species which is rare and restricted at the present time and not previously found as a fossil in Britain. An investigation of the deposit was made, including two exploratory boreholes. This account records the information available at present on the deposit.

GEOLOGY OF THE AREA

Burton Salmon is situated on the dip slope of the Upper Magnesian Limestone where it passes eastward beneath the 25-Foot Drift deposits of the Vale of York (Fig. 1). The latter consist of bedded sand, silt and clay, and are believed to be mainly of lacustrine origin, formed (in "Lake Humber") during the later part of the Weichselian (Devensian, or last) glaciation.

At a locality (SE 4866 2811) 870 metres (approximately 950 yards) N.N.W. of Burton Salmon, a natural amphitheatre called the Punch Bowl has been formed in the limestone by a spring. The reason for the spring is not apparent, but it may be situated on the extension of a fault mapped farther to the north-east (see one-inch Geological Survey sheet 78) and related to similarly trending faults proved underground in Coal Measures to the south-west. A channel, now scarred by old quarries, has been cut into the limestone from the Punch Bowl in a southerly direction and continues across the lower ground south of Burton Salmon, where it is incised into the 25-Foot Drift. A second channel, apparently also caused by a spring, runs northward from a locality (SE 4905 2663) 770 metres (approximately 850 yards) south of Burton Salmon, and the two channels unite just to the west of Poole. The eventual outlet for the channels is indistinct, but it is probably along a shallow depression running eastward from Poole which reaches the river Aire near Birkin.

The spring at the Punch Bowl still maintains a small permanent pond, but that to the south of Burton Salmon appears to be dry, although it may have a small seasonal issue. Both springs must formerly have been much larger in order to have cut their outlet channels. Recent evidence from the Vale of York (Gaunt and others, 1971) has indicated that incision of streams and rivers into the 25-Foot Drift commenced towards the end of Weichselian (Devensian) times, and it is assumed that incision of the channels into the 25-Foot Drift at Burton Salmon was either contemporaneous or later. The deposits subsequently formed within these channels are likely to be entirely Flandrian (post-glacial) in age, a conclusion supported by pollen analysis of the available samples (see below).

On the limestone outcrop the floors of the channels contain thin peaty clay resting on stiff silty and "marly" clay, with clayey limestone gravel at depth in places. In the lower-lying areas the channels are swampy, with some stretches of standing water, and augering within the channels proved thin peat and peaty clay on shell marl with interbedded peat and clay.

A temporary excavation (SE 4913 2731; point A, Fig. 1) into the channel on the south side of Burton Salmon exposed peaty soil, 0.4 to 0.6 metre thick on shell marl to 3 metres. No detailed stratigraphical observations were possible due to severe slumping. A horn core, identified as *Bos primigenius* Bojanus (aurochs or giant ox) was found during the initial excavation.

Using a Hiller-type borer, a borehole (borehole A) was drilled from the bottom of the excavation to a depth of approximately 7.5 metres below original ground level (the limit of the borehole equipment) without reaching the bottom of the shell marl. This borehole was drilled in a hurry in order not to hold up the contractors operations, and only one sample, from the bottom, was taken (see pollen analysis).

¹ Published by permission of the Director, Institute of Geological Sciences.

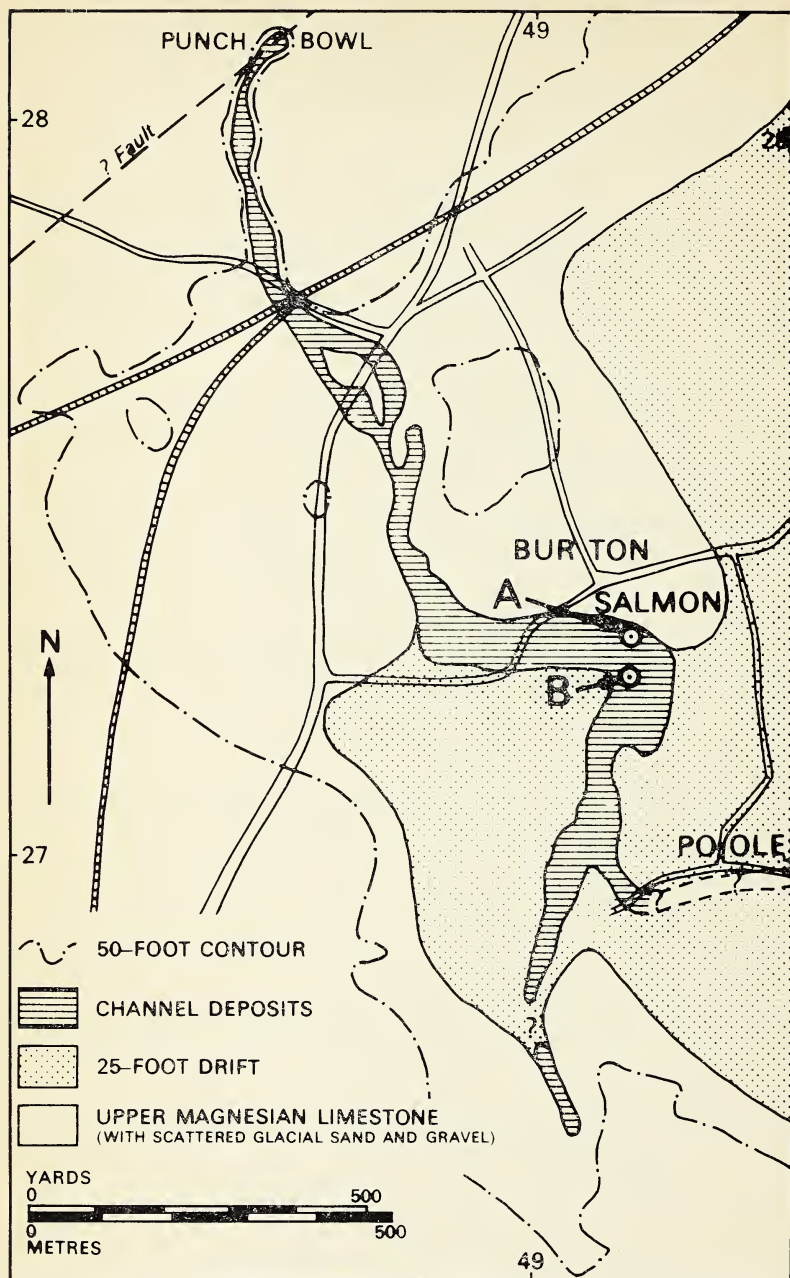


Fig. 1. Generalized geological map of the Burton Salmon area

A second borehole (borehole B) was drilled at a locality (SE 4913 2725; point B, Fig. 1), about 60 metres south of the excavation, which proved the following succession:

	Depth in metres
Topsoil, peaty clayey	to 0.30
Peat, with shells below 0.54 metre	„ 0.60
Shell marl	„ 0.70
Peat, with shells above 0.76 metre	„ 1.30
Shell marl	„ 1.52
Peat	„ 1.60
Shell marl, becoming sandy below 3.50 metres	„ 3.60
Grey sand with gravel at base	„ c. 3.80
Hard rock, presumably limestone	—

It is clear from the sections proved in boreholes A and B and from their positions relative to the channel (Fig. 1) that locality A is situated near the outer, deeper part of an incised meander, locality B being on the more shallow inside bend.

It is also clear from the existence of the shell marl and its fauna that at some time the outlet channel must have become progressively blocked downstream in order to create lacustrine conditions, which are not common within equivalent channels in the Vale of York. The blockage may have been caused by slumping of the channel sides or by choking with floating vegetation, or both, with consequent silting up on the channel. It is significant that the 25-Foot Drift east of Poole, where the original outlet channel was probably situated, is mainly silty sand, which would allow some sub-surface drainage and may have prevented the channel from being re-excavated later.

POLLEN ANALYSIS

Only one sample was taken from borehole A, and that was from the bottom of the hole at a depth of 7.5 metres. The pollen spectrum (Table 1) shows high values of *Betula* (birch), *Pinus* (pine) and *Ulmus* (elm) with a lower value of *Quercus* (oak). It belongs therefore to pollen zone VIa and the shell marl at this level must have been deposited during the early Boreal period.

Seven samples from borehole B were analysed for pollen. There was no pollen in the basal sand but the results from the other six samples (Table 1) give some indications of their ages. The shell marl at 3.0 metres shows a high value of pollen of *Quercus*, a lower value of *Ulmus* and only very low values of *Alnus* (alder) and *Tilia* (lime). It must belong therefore to pollen zone VIc, that is, late in the Boreal period. At 2.0 metres the pollen spectrum has changed to one of high values of *Quercus* and *Alnus*, with *Ulmus* of secondary importance but still relatively high. This sample and also that from 1.5 metres clearly belong to pollen zone VIIa, the Atlantic period. Samples at 0.9, 0.6 and 0.4 metres show a complete dominance of tree types by *Quercus*, with *Ulmus* falling to very low values but with small percentages of pollen of *Fraxinus* (ash). Such pollen spectra are characteristic of zone VIIb which corresponds to the Sub-Boreal period. Pollen of *Plantago lanceolata* (ribwort plantain) at 0.6 metre, indicating the presence of pasture, again suggests zone VIIb but the very low values and also the very low values of *Pteridium* (bracken) spores suggest a position very early in the zone. The high value of pollen of Cyperaceae (sedges) at 0.9 metre suggests the presence of a reedswamp.

An interesting feature of the pollen spectra is seen in the values for aquatic species. It is strange that the deepest deposits (7.5 metres in borehole A) contain no aquatic pollen. This may be because the water was too deep and perhaps flowing too swiftly to allow the growth of aquatic species. In the shallower deposits proved in borehole B there is from 2.0 metres up an increase in the values of aquatic pollen types. *Nymphaea* (white water lily) indicates fairly deep water, while Cyperaceae, *Typha-Sparganium* (reedmace and bur-reed) and *Potamogeton* (pondwood) together suggest the development of a shallow-water reedswamp.

The implications concerning sedimentation are that there was probably a rapid deposition of shell marl during the Boreal and Atlantic periods, though one cannot assume that all the marl in the channel from 7.5 to 3.0 metres was deposited in the Boreal because these two samples are not from the same part of the channel. The evidence suggests that there was a considerable depth of water in the channel during the Boreal and Atlantic periods but that because of the build up of the marl or perhaps a fall in the water table the water had become shallower by the end of Atlantic time and there was during the Sub-Boreal the development of a sedge reedswamp which resulted in the formation of a peat from 0.7 to 1.3 metres. The peat from 0.3 to 0.6 metres is

TABLE I
FREQUENCIES OF THE VARIOUS POLLEN AND SPORE TYPES FROM THE
DEPOSITS AT BURTON SALMON

(Values expressed as percentages of total tree pollen, excluding *Corylus* and *Salix*)

Zones Depth in metres	Borehole A	Borehole B					
	VIa 7.5	VIc 3.0	VIIa 2.0 1.5		VIIb 0.9 0.6 0.4		
<i>Betula</i>	39	4	8	8	3	6	2
<i>Pinus</i>	20	10	1	1	5	1	8
<i>Ulmus</i>	28	16	16	16	3	1	4
<i>Quercus</i>	11	64	41	39	67	56	51
<i>Tilia</i>	1	4	7	6	8	1	7
<i>Alnus</i>	1	2	27	29	10	32	28
<i>Fraxinus</i>				1	4	3	
<i>Corylus</i>	484	137	40	28	33	52	71
<i>Salix</i>	12	1	1	2	1	1	3
<i>Hedera</i>		1					
Gramineae	6	2	3	10	13	16	24
Cyperaceae	3	2	3	4	145	15	27
Caryophyllaceae	2						
Cruciferae						3	7
Umbelliferae					3		3
<i>Taraxacum</i> type					1		1
Scrophulariaceae							1
<i>Ranunculus</i>	2		2			1	
Chenopodiaceae	1						
<i>Plantago lanceolata</i> L.						2	
<i>Galium</i>			1				
Unknown	10	1	3				
<i>Potamogeton</i>		1		3	1	1	70
<i>Typha latifolia</i> L.							2
<i>Typha-Sparganium</i> type				2	2	6	41
<i>Nymphaea</i>			1	4	1	4	1
<i>Batrachium</i> type							4
<i>Equisetum</i>		3	2	6	1	1	
Filicales		2	1	1	3	1	
<i>Polypodium</i>		1	1		3	1	2
<i>Pteridium</i>					3		
<i>Sphagnum</i>				1			

also associated with a reedswamp of either *Typha* or *Sparganium* with *Potamogeton*. The 0.1 metre layer of marl between these two peats obviously represents a period of flooding, the reedswamp species being poorly represented in the pollen spectrum.

MOLLUSCAN FAUNA

The molluscs identified in the shall marl and associated peat are given in Table II. The only uncommon species in the deposit, *Pisidium pseudosphaerium*, is confined in the British Isles at present to marsh drains around Pevensey and Lewes (Sussex) and Glastonbury (Somerset), together with isolated occurrences in marl pits at Bromborough (Cheshire) and in canals in Ireland (Dance 1956, 1957, Kerney 1968, Kuiper 1949, McMillan 1962). It has not previously been found as a fossil in this country, but is known from the Flandrian of Denmark and the Pleistocene of Germany.

Thirteen species were identified in borehole B, but *Succinea* sp(p). was present only near the top. A count was made of the number of individuals present in half-metre lengths of core starting at a depth of 0.6 metre, the top of the highest shell marl bed. The total count in all lengths of core was over 50, in most of them being over 100, and the results, calculated on a proportional basis, are shown on Fig. 2.

It is clear from a comparison of the sections of boreholes A and B and from their positions relative the channel that the lowest shell marl in borehole B, of later Boreal

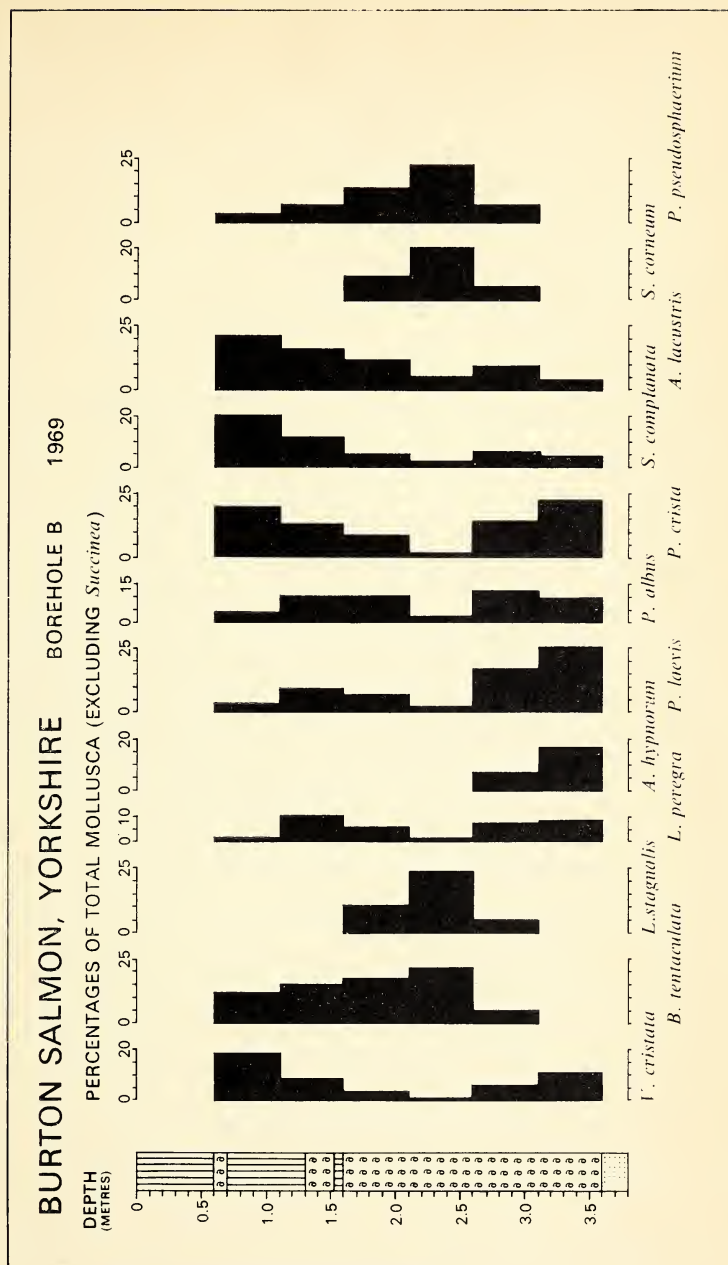


Fig. 2. Relative abundances of molluscan species in borehole B, Burton Salmon.

age, represents a marginal deposit in a lake that had already existed for a considerable time. The abundance of *Aplexa hypnorum*, typical of flooded grassland, and *Planorbis laevis*, indicative of undisturbed stony lake margins, conforms with this interpretation. Together with *Planorbis crista* they are suggestive of an unshaded lake margin.

TABLE II

MOLLUSCAN FAUNA FROM SHELL MARL AND PEAT AT BURTON SALMON

List arranged according to Ellis (1951). Asterisks denote species found in excavation A but not in borehole B

Gastropoda

<i>Valvata cristata</i> Müll.	<i>Planorbis crista</i> (L.)
<i>Bithynia tentaculata</i> (L.)	* <i>Planorbis contortus</i> (L.)
* <i>Lymnaea truncatula</i> (Müll.)	<i>Segmentina complanata</i> (L.)
<i>Lymnaea stagnalis</i> (L.)	<i>Acroloxus lacustris</i> (L.)
<i>Lymnaea peregra</i> (Müll.)	<i>Succinea</i> sp.(p.)
<i>Aplexa hypnorum</i> (L.)	* <i>Vertigo antvertigo</i> (Drap.)
* <i>Physa fontinalis</i> (L.)	* <i>Helix nemoralis</i> (L.)
* <i>Planorbarius corneus</i> (L.)	* <i>Hygromia hispida</i> (L.)
* <i>Planorbis carinatus</i> Müll.	* <i>Discus rotundatus</i> (Müll.)
* <i>Planorbis planorbis</i> (L.)	* <i>Oxychilus cellarius</i> (Müll.)
<i>Planorbis laevis</i> Alder	* <i>Oxychilus alliarius</i> (Miller)
<i>Planorbis albus</i> Müll.	

Lamellibranchiata

<i>Sphaerium corneum</i> (L.)	<i>Pisidium pseudosphaerium</i> (Favre)
* <i>Pisidium obtusale</i> (Lamarck)	

A marked faunal change occurs between the lowest, Boreal shell marl and that from between 1.6 and 2.6 metres which in part at least is of Atlantic age. *A. hypnorum* disappears, three other species, *Valvata cristata*, *P. laevis* and *P. crista* decrease markedly in abundance and four new species, *Bithynia tentaculata*, *Lymnaea stagnalis*, *Sphaerium corneum* and *Pisidium pseudosphaerium* appear and become dominant. This change indicates that the lake has expanded beyond the site of borehole B, which is no longer in a marginal position, and it suggests a correspondingly greater depth of water. This could very well be due to the effects of increased rainfall which is generally postulated for the Atlantic period. It also indicates an increasing stagnation, probably with an increase in aquatic and semi-aquatic vegetation, and possibly with areas of water shaded by *Alnus* and *Corylus* (hazel). The decline of *P. laevis* probably reflects increasing acidity due to the presence of decaying vegetation.

Another marked faunal change is apparent between 1.6–2.6 metres and the highest sample, 0.6–1.1 metres, that is, from Atlantic to Sub-Boreal times. The revival of *V. cristata* and *P. crista* probably resulted from a decreasing depth of water. Certainly the deposits recorded in the upper part of borehole B indicate periodic expansion of marginal swamp vegetation corresponding to intermittent shrinking of the area of open water. This increase in both aquatic and semi-aquatic vegetation accounts for the disappearance of *L. stagnalis* and *S. corneum*, the flourishing of species such as *Segmentina complanata* and *Acroloxus lacustris* and the appearance of the semi-aquatic *Succinea* sp.(p.).

A larger, more diverse molluscan fauna was identified in the excavation at locality A (see Table II). This reflects the wider range of micro-environments which existed towards the centre of the channel as the swamp vegetation encroached on the remaining areas of open water, which in all probability were finally constricted into a meandering, sluggish stream course.

ACKNOWLEDGEMENTS

We are indebted to Mr. P. J. Boylan (Exeter Museum) for the identification of the horn core of *Bos primigenius*, and to Dr. M. P. Kerney (Department of Geology, Imperial College) for the identification of *Pisidium pseudosphaerium*.

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THE MAMMALS OF MOORLANDS NATURE RESERVE, YORK

N. C. COWX

On the seventh of February 1970, 144 Longworth Mammal Traps were laid in Moorlands Nature Reserve belonging to the Yorkshire Naturalists' Trust. The work was done as a demonstration in trapping technique to members of the Yorkshire Mammal Group whose assistance is gratefully acknowledged. The traps were laid in six lines of twelve trapping sites in such a manner that all the various types of habitat that the reserve offers were sampled for their small mammal inhabitants. Two traps were laid at each site and the sites were 5 yards apart. Line A was laid in fairly open woodland (mainly ash (*Fraxinus*)). The field layer was limited to the trunks of the trees and the ground was covered with a two inch layer of leaf litter. Line B was laid on the east edge of this habitat under a Rhododendron hedge bordering a field which had grown cereals in 1969. Lines C and D were laid as one long line right down the centre of a thickly planted larch plantation occupying the north-west portion of the reserve. The trees were some twenty feet high and the field layer was limited to their trunks only. The ground was covered by a thick layer of pine needles. It was here that the owl pellets were found together with several fox scats. Line E was half in the maturing, mixed deciduous planatation at the north of the Reserve and half in the once rabbit-proofed enclosure of young conifers. The former had a well developed field layer of grasses but the latter was lacking in this and the ground was very much wetter with patches of *Sphagnum* sp., and other mosses. In this area there was evidence of Field Vole (*Microtus agrestis*) runways currently in use as shown by the presence in them of freshly cut grass and piles of green droppings. Line F was laid along the edges of the enclosure under Rhododendron bushes that were very well developed and provided dense cover.

The traps were lifted and examined at midday and during the afternoon of the 8th February. During the twenty-four hours that the traps were laid the weather was fine but windy and cold. Nineteen mammals were caught: 11 Wood Mice (*Apodemus sylvaticus*), 3 Bank Voles (*Clethrionomys glareolus*) and 5 Common Shrews (*Sorex araneus*). No Field Voles (*Microtus agrestis*) were caught but from the evidence cited above they can be safely said to be present on the reserve even if the numbers are not high. No evidence of the Pygmy Shrew (*Sorex minutus*) or of the Water Shrew (*Neomys fodiens*) was seen either from traps or from the analyses of owl pellets found in the larch plantation.

Even taking into account that the time of year was such that the small mammal populations would be at their minimum and the possible effect of the weather on the trapping success, the mammal count was surprisingly low for the types of habitat the reserve offers as compared with similar areas around York. There was evidence of considerable natural predation by foxes and owls but the reputed large number or feral or semi-domesticated cats present in the neighbourhood (of which several were sited) no doubt pays a heavy toll on the small mammal population.

The various species of small mammal present were not evenly distributed throughout the reserve. *Apodemus* was found in all habitats and formed the bulk of the catch in those woodland areas with little ground cover. *Clethrionomys* (a species not previously recorded in the Parish of Skelton), was limited to the dense cover provided by the Rhododendrons. *Sorex araneus* seemed to be fairly common in all areas particularly where deep leaf litter provided an abundance of its invertebrate food.

Specimens were taken to furnish the Yorkshire Museum with sample skins from the area and the shrews were also investigated for internal parasites. All shrews captured were in winter pelage and most showed albinism to some degree in the form of white ears and white tail tips. The *Apodemus* had a well developed chest spot (more so than in any other area trapped around York) and a darker belly fur. None were in breeding condition and all the males had testes well below the minimal size found in animals with sperm present in either testes or epididymis in previous work. As might be expected the females were in anoestrus. The *Sorex* and *Clethrionomys* were also not in breeding condition.

Analysis of the eight pellets of the Tawny Owl (*Strix aluco*) found scattered in the larch plantation, yielded the following information: Table 1.

TABLE 1		
Analysis of Owl Pellets		
Identifiable Bones	Number of Pellets containing them	
<i>Apodemus sylvaticus</i>	3	
<i>Clethrionomys glareolus</i>	1	
<i>Sorex araneus</i>	1	
<i>Talpa europaea</i>	1	
<i>Oryctolagus cuniculus</i>	1	
<i>Rattus norvegicus</i>	1	
Unidentifiable small birds	2	

One of the pellets also contained remains of the large dung beetle *Geotrupes* sp.

Many recent signs of Badger (*Meles meles*) activity were seen around the sett in the reserve and a footprint of a Roe Deer (*Capreolus capreolus*) was observed in soft earth recently excavated by the Badgers. Fox scats were abundant, particularly in the larch plantation. It must be stated however that they would be much more readily seen here on the carpet of pine needles.

ECTOPARASITES OF THE SMALL MAMMALS

Very few parasitic mites were observed and none was collected. No ticks were found on any of the species. Lice were minimal in their occurrence. All fleas were collected and classified alive under the microscope and their reproductive condition noted. *Apodemus* was found to be infested with only the commonest rodent flea, *Ctenophthalmus nobilis*. The sex ratio of the fleas was 9♂:10♀. All the females were distended with ripe eggs. The average number of large ova found per female was 3. Seven of the males were of the subspecies *C. nobilis vulgaris* whilst the other two appeared to be *C. nobilis nobilis* or possible hybrids. As appears usual from previous work, the male *Apodemus* were more heavily infested than the females. One male had 16 out of the total of 19 fleas found on this species.

All of the three specimens of *Clethrionomys* were infested with fleas. Two species were recorded from this host, *Malareus penicilliger*, a common parasite of Bank Voles elsewhere in the York area was represented by a single female. The other two fleas found on this host were both *C. nobilis* ssp. females.

The shrews were dead in the traps and thus the flea count was less reliable but two species were recorded. *C. nobilis* ssp. (2♀) and a single *Hystrichopsylla talpae*♀.

ENDOPARASITES OF THE SMALL MAMMALS

The shrews were examined for endoparasites but as these have not all yet been classified no details will be mentioned here. Nematodes were found in the gut and cysts of *Porraecacum* were common under the skin. Four specimens of a Digenean fluke were obtained from their stomachs and also several species of tapeworm were present.

WEIGHT RANGE OF THE CAPTURED MAMMALS

Apodemus males — 2 weighed 16 gms, 1 19 gms, females 3 weighed 14 gms, 3 17 gms., 2 19 gms.

Clethrionomys — the male weighed 14 gms. and females 13 gms. and 12 gms.

The *Sorex araneus* were not weighed as they possibly had been dead for some time and the weights were thus not significant.

THE OCCURRENCE OF THE MOSS *PHYSCOMITRIUM SPHAERICUM* (SCHKUHR) BRID. IN YORKSHIRE

B. J. O'SHEA

Physcomitrium sphaericum (Schkuhr) Brid. is a rare, ephemeral moss of exposed margins of lakes and reservoirs, and mud in drained pools. An account of the original Yorkshire record in 1947, and of the other older records known at that time, has already been given (Wallace, 1948), and a map of the known distribution of the moss in 10 km. grid squares has now been compiled for the British Bryological Society mapping scheme (O'Shea, 1971). Of the ten vice-counties from which the plant is recorded (E. Sussex, W. Kent, Surrey, Staffordshire, Fife-with-Kinross, and those tabulated below), one record is based on literature and cannot be supported by a specimen, and four are more than twenty years old; the remaining five vice-counties provide eight localities, one of which is in Renfrew, and seven are in the south Pennine area. The plant thus now appears to be mainly a plant of the south Pennine reservoirs.

The localities are as follows:

VICE-COUNTY		LOCALITY	10 km. GRID REF	SPECIMEN	DATE LAST SEEN
57	Derbyshire	Combs Res. } Goyt Res. } nr. Chapel-en-le-Frith	43/07	Hb RH Hall	Autumn 1955
58	Cheshire	Toddbrook Res. nr. Whaley Bridge	43/08	Hb RH Hall	11.49
63	SW Yorks	Damflask Res. nr. Sheffield	43/29	Hbs BBS & O'Shea	12.69
64	MW Yorks	Swinsty Res. } Swinsty Res. } Lindley Res. }	44/15	Coll. WA Sledge	10.59
		Washburn Valley nr. Harrogate	44/25	Hbs O'Shea & ERB Little	8.69
			44/24	Hb M Dalby	11.69
76	Renfrew	Balgay nr. Barrgate	26/55	Hbs BBS & AMcG Stirling	1.67

The habitat at all the sites listed above, except the Scottish locality, is the exposed margin of a reservoir, which is why the dates involved are in late summer to early winter. Although the habitats are similar, the substrate on which the plant was growing varied from a sandy shale to caked mud. Unfortunately, detailed information on habitats is not available. Its habitat on the Continent is described as also including muddy fields (or wet clover fields) and muddy places in the neighbourhood of streams which often overflow (Schimper, 1836-51). Neither of these habitats are known to yield the plant in Britain, although members of the genus *Physcomitrium* in other parts of the world appear to prefer such habitats.

Present literature on *P. sphaericum* does not indicate that the moss has any preference for sites in Britain other than by or in depleted reservoirs or ponds. There are difficult problems involved in attempting to explain the distribution of a plant that will not only disappear from a site for several years, if not permanently, but will also grow at an apparently arbitrary choice of the available localities. Its requirements are probably not so much capricious or erratic, as very strict. The closely related and much rarer *P. eurystomum*, which has disappeared from its original site at Langmere in the Norfolk breckland, and now grows as far as we know only at Startop's End Reservoir, near Tring, is a plant of the chalk in this country, but appears on the Continent to have a similar distribution to *P. sphaericum*, although rarer. Probably the bare, cracked mud of its locality is as important as the chalk content, but it would require extensive research to come to any useful conclusion about the habitat requirement of either moss, or to explain the reasons for *P. sphaericum*'s apparent liking for gritstone reservoirs.

P. sphaericum looks very much like a small form of the common moss *Pottia truncata* in the field, but that plant always has the capsule longer than broad, whilst *Physcomitrium sphaericum* has, as the name suggests, a spherical capsule which when old becomes much more turbinate than in *Pottia truncata*. Microscopically, *P. truncata* always has an excurrent nerve, and the cells of the upper leaf are not as long, nor are the projecting cell walls usually so prominent, as in *Physcomitrium sphaericum*. However, the size of *P. sphaericum* and its parts can vary considerably, and at times it may attain the size of *Funaria fascicularis*, from which it can be distinguished by that plant's lack of a beak to the capsule. The differences between *P. eurystomum* and *P. pyriforme* are already tabulated (Ducker and Warburg, 1961).

This is a moss that is not difficult to recognise, (although the stems, being small and scattered, are often insignificant), and should be looked for whenever a suitable habitat appears. If it is more widely distributed in Yorkshire than has previously been recognised, then it should quite easily be discovered. Several reservoirs in the south Pennines are already known to be sites of bryological interest, for instance several provide sites for *Discelium nudum*, and these and many others could quite reasonably be expected to be also sites for *Physcomitrium sphaericum*.

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Introduction to the Study of Animal Populations by H. G. Andrewartha. 2nd ed.ion. Pp. xiv + 283. Methuen. 1970. £2.50.

It is now sixteen years since Andrewartha and Birch produced a challenging volume, the *Distribution and Abundance of Animals*, in which they attacked the prevailing "dogma" of the widespread importance of density-dependent factors in the regulation of population size. The fact that these last sixteen years have been intensely productive in the field of ecological research and the fact that both Andrewartha and Birch and their opponents still retain their original opinions with very little modification points to the intrinsic difficulty of providing satisfying theories of population regulation of wide applicability even when these are only qualitatively expressed.

Professor Andrewartha's second edition of his *Introduction to the Study of Animal Populations* incorporates some new material but retains the main format of the first edition and retains the same approach to the subject and the same exposition of the Andrewartha and Birch general theory. It is intended as an undergraduate textbook for both theory and practical work. The latter is extremely useful and the exposition of the theory very clear and concise. It is a pity however that such an undergraduate text should be limited entirely to one viewpoint. A balanced exposition of the chief schools of thought in the field of population ecology would have provided a much more valuable basic undergraduate text as well as an interesting contribution to ecological polemics!

E.B.

Animal Taxonomy by Theodore Savory. Pp. 102 with 10 figs. *Scholarship Series in Biology*. Heinemann Educational Books. 1970. £1.05.

Systematics is the only way to save biologists from zoological and botanical chaos. But though systematists have acquired a cloak of respectability after the disrepute into which taxonomy at one time fell, their aims and objects, their basic concepts, principles and methods, and the problems confronting them in the effective practice of their science, still receive scant attention in most school and university courses. Where covered in text books, the treatment is usually dull and lifeless. Mr. Savory's treatment is the very reverse; it is lively and even entertaining as well as thoroughly competent. The historical approach, the phylogenetical aspect of classification, numerical and chemical taxonomy, the species problem and the conflict of categories, the principles of nomenclature and the difficulties of reconciling theory with practice, are all admirably surveyed. The book is designed for sixth form and first year university courses but is one which could well be read both with enjoyment and profit by the majority of zoologists, professional and amateur alike.

W.A.S.

A BACKWARD LOOK

G. A. SHAW

In the archives of the Bradford Naturalists' Society are two old volumes of newspaper cuttings which contain much natural history matter, reports of many meetings of the Bradford Naturalists and of some Y.N.U. field meetings, mostly the work of J. W. Carter and H. T. Soppitt. Although much serious work was done, that there were lighter interludes is shown by the programme for a soirée held by the Bradford Naturalists on 10th December 1878. After a tea at 6.30, the proceedings were opened by a piano solo by Wm. West, the overture to "Fra Diavolo", although a pencilled alteration appears to indicate that the "Wedding March" was substituted for this item. Then followed recitations, songs, violin solos, the first verse of "Christians Awake" "by the entire company", readings and so on. Any short speeches that had to be given "to be interpolated at the discretion of the President so as not to weary the ladies".

Reports of former Y.N.U. meetings are often enlivened by light-hearted accounts of humorous incidents which seemed to occur more frequently then than they do at our present-day meetings. A good example occurs in a newspaper account of the meeting at Gormire on 20th July 1887 — "... by this time the Conchologists had become disheartened, for in spite of their vigorous searching, only three of the commonest species had fallen to their lot. There was a gleam of hope, however, for hidden away in a secluded hollow was noticed a good-sized heavy boat, with which it was thought some good things might possibly be obtained. After an enormous amount of labour the boat was launched and taken possession of by the 'shell hunters', but not for long, for hardly had they taken up their positions, pushed off and got into deep water, than it was found the boat leaked seriously, and they were only too glad to reach *terra firma* and abandon Conchology for the rest of the day". On this occasion, dinner was taken at Thirkleby Park (at 3.0 p.m.!) by invitation of Sir Ralph Payne-Gallwey, the President for that year.

On 21st September of the same year a meeting was held at Hatfield Chase. Extracts from a newspaper report follow: "In due time the party arrived at the village and caused no little consternation among the inhabitants, who gazed in curiosity at the visitors as they marched through with their vasculums, bags, hammers and other paraphernalia. It was evident that something unusual was expected, for at the meeting place — the Blue Bell — was suspended from the uppermost window an immense "Union Jack", a true indication that meant business. . . . just then a stout, well-built gentleman in black appeared upon the scene — the genial but eccentric vicar of Hatfield, the Rev. G. P. Haydon, bringing with him an old resident, a gamekeeper, who he said 'knew every inch of the ground', having had experience of the neighbourhood for nearly 70 years, and would guide the party anywhere they wished to go. This was very kind, but naturalists on a field day desire to cover as much ground and do as much work as possible, and to have an old man 76 as a guide would have been a hindrance rather than a help, and thereupon a small party intent upon Botany, Conchology and Ornithology set out immediately on their own responsibility without a guide, and left the others to make what arrangements they chose. But these also ultimately decided to leave the gamekeeper behind, and thus caused grave offence to the singular gentleman already alluded to. . . . A party of four struck due south across a vast purple-clad heath, now and again stopping to collect a rare plant, then deviating a little to the left to see something unusual that one of them had just detected in the insect way, or winding more to the left still to gather some bright coloured fungi. After walking for about an hour and a half in this fashion it began to be monotonous and also swampy. What puzzled them was that the south extremity of the moor seemed to be as far off as ever; they were evidently lost. Under the circumstances it was thought advisable to strike out for a village that lay to the right, which they did. A little further, and on the edge of the moor was observed a woman gathering blackberries, from whom was learned, to our astonishment, that the village was Wroot, in Lincolnshire, and was several miles over the border. 'We have no business here', said one of the party, 'and must hasten back to our own county at once'. Three different enquiries were made as to how far Hatfield was. It was first four miles, then seven and then, to our dismay, nine, until they began to think that the best policy would be to hire a trap. A trap was sought up, and in a few minutes the party were driving at a rapid rate back to Yorkshire. . . . On leaving the village (after the meeting) some of the natives gave three ringing cheers for the Naturalists."

In a report of a Y.N.U. meeting at Grassington on 20th June 1891 "no small amount of discontent was expressed at the manner in which the excursion was arranged and conducted. It appears that in all the sections except geology none of the leaders put in an appearance, and there was no one to indicate the likeliest hunting ground to the various parties." In botany the most interesting find fell "to Mr. Beanland, when he discovered the Alpine Bistort (*Polygonum viviparum*), a plant hitherto not recorded for Wharfedale, and a very rare Yorkshire species". During a Sectional meeting in the grounds of Grassington House "from an overhanging Elder tree an object suddenly fell almost on to the table, was speedily secured, and proved to be the rare Whiskered Bat".

The circular for a Fungus Foray at Doncaster, 16th September 1891, states that "The party will dine together at 'The Glyn Hotel' at six p.m. Charge for Dinner (at which edible fungi will be served), 2/6 each." Our cutting book gives a lengthy account of the collecting done at this meeting, and it was evidently a tiring day, as towards the end "it was not astonishing to find that a few had found a comfortable seat in the waggonette long before the time to return". "At six o'clock the company dined together at the Glyn, and a conspicuous feature of the dinner, which was looked forward to with mingled curiosity and suspicion by not a few, was the fact that fungi were to be served. The species dealt with were *Coprinus comatus* and *Hygrophorus eburneus*, neither of which were nice, through being overdone by the cook with bovril and goodness knows what else."

One more extract from a report of a Fungus Foray (Maltby 1905) must suffice: "The foray was not all work and no play. On our Wednesday wandering we came across a signboard before which all pulled up. It was conspicuously painted in black letters on a white ground, and could almost have been read in the night-time. It was at the entrance to a track at a wood corner leading to a farmhouse. Evidently the farmer was determined not to be troubled by tripper, tourist, or tramp. The sign read:

NO ROAD. NO STABLING.
NO HOT WATER FOR TEA
BEWARE OF THE BULL DOG

While we were admiring this emphatic signboard, a pert, threequarter-grown fox-terrier, with a black patch around his right eye, barked away 'as savage as a razor-grinder'; in his wake there loomed up a sleepy, innocent-looking hound with liver-coloured haunches and flabby, drooping, yellow-brown lugs. One of our party, admittedly not well versed in 'doggy' distinctions, wondered which was the 'Bull Dog'. As none of the negatives were needed, and the bull dog a myth, the situation was enjoyed as an amusing diversion from toadstool hunting. . . . The usual sampling of a few edible species at breakfast was indulged in. On the several mornings about eight species were cooked, including a couple of pounds of the beef-steak fungus, which was considered a great delicacy: and tender."

A Guide to the Native Mammals of Australia by W. D. L. Ride. Pp. 249 with 62 black and white drawings. Oxford University Press, 1970. £4.25.

This is really a quite remarkable book, as unusual in many ways as the animals which form its theme. It is not by any means a field guide and yet it contains identification data to a high level. It also contains very readable accounts of the lives of Australian mammals, a check-list "for the student and professional user", suggestions for further reading and, the best plea for conservation of the unique Australian wildlife which has appeared to date.

With a book devoted to such diverse aspects of the central theme one expects short-comings somewhere, but these are not apparent to me. The black and white drawings by Ella Fry form a charming gallery of mammal portraits and details of the specimens, mainly alive in captivity, are given in the appendix. The plan of the illustrations is to combine scientific accuracy with the correct postures and action as observed live or recorded by photographs. Mammalogy in Australia is still a young study and many things remain to be done before our knowledge of this remarkable fauna is anything like complete. Time is of the essence as man-made changes take place in the habitats of this country at a rapid rate. Books like this with their multi-lateral approach should have considerable effect in giving mammals and mammalogists time to work out formulas for peaceful co-existence.

Full credit is due to the author, artist and publishers for a book which should be widely read at both ends of the world.

T.M.C.

WAXWINGS IN THE OTLEY AREA, WINTER 1970-1971

A. H. MALLINSON

My first sighting of Waxwings came on 14th November, though I was pretty sure I had heard them at least a week earlier. A group of from eight to ten fed mainly on apples remaining unpicked on big, old trees in an adjoining garden. Periodically, birds seemed to leave this group to feed on berries of *Cotoneaster simonsii* in our own garden. The plants in this hedge were propagated in 1964 and planted in 1966 with the possibility in mind of attracting Waxwings.

On several days between 21st and 25th November, four to seven birds visited a large bush of *Cotoneaster horizontalis* about a yard from our front-room window on a number of occasions, and fed while my wife and I were standing at the window. As time passed they became progressively more timid, being disturbed by passing traffic on the road and pedestrians on the footpath approximately twelve yards away.

On 25th November, I came across a group of twenty-eight feeding on haws near the centre of the town and during the next week saw small parties of up to a dozen birds feeding on haws in a number of places round the town, with a group of ten to fifteen feeding on the apple trees mentioned above. They became even more timid, moving over to the other sides of the trees and often taking wing when I walked up our garden.

During the exceptionally mild weather in early December, the group stayed around the apple trees and numbers of birds in the afternoon seemed to enjoy sitting in the sun on the topmost branches of these and other trees nearby. Quite frequently they indulged in "flycatcher-like" flights as though chasing midges on the wing. I watched this with field-glasses on a number of occasions but could not confirm that they took any insects. By this time a number of Blackbirds and Starlings had moved in to feed on the apples, comparatively few of which were now left on the trees though there were many fallen fruits on the ground. On one occasion towards the end of the third week of December, I saw the Waxwings investigating the fruits of *Chaenomeles* on the bushes forming part of a mixed hedge in our back garden. The *Chaenomeles* was also planted in the hope of attracting Waxwings. It is very popular with Greenfinches.

On 24th December, I saw Waxwings down on the ground for the first time, feeding on fallen apples along with Blackbirds and Starlings. The spell of severe weather which came at Christmas brought in large numbers of Blackbirds (max. 35 at a time) and Fieldfares (often 50 or more) and the general brawling, bullying tactics of these birds upset the Waxwings and by 30th December they deserted the area.

On 9th February a party of seven Waxwings appeared on the apple trees during the afternoon, but finding no fruit soon took off.

On 1st March I saw a group of four Waxwings investigating shrivelled fruits on an ornamental crab apple in the Memorial Garden in the town centre. They did not seem to like the fruit and left quite soon.

On 8th March one Waxwing paid a brief visit to the apple trees mentioned at the beginning of these notes.

On 15th March three Waxwings were sitting in an elm tree by the roadside a short distance away. At first it seemed as if they were interested in the flower buds, but during the short time I watched them I saw no feeding going on.

In the winter of 1968-1969 we had a party of six Waxwings in this immediate neighbourhood. They fed almost continually on small immature apples which remained firmly attached to the trees, through February into mid-March, and on that occasion the birds took very little notice of people. In 1969-1970, I saw only one Waxwing. It was feeding on rose-hips, about the only fruit available that winter. By contrast, the 1970-1971 birds not only arrived earlier than usual, but also to a glut of food. In consequence they fed in a more relaxed way. Apart from the first few days after they arrived (when they were almost as tame as usual) this year's birds have been much more timid and very easily disturbed, possibly because other sources of food were readily available within close range.

WAXWINGS, 1970-1971 WINTER

The Secretary of the Ornithological Section has already collected a large number of records from non-members, *via* the press, of the exceptional numbers of Waxwings occurring in Yorkshire during this past winter. It is proposed to write this Waxwing invasion up as a separate paper for *The Naturalist* in the near future rather than wait for all records to come in at the year end.

Will members, therefore, please let Mr. Dickens have details of all Waxwings seen during the 1970-71 winter **as soon as possible**? He will undertake to pass these on, when processed, to the appropriate vice-county recorders so that sending them now will not be an additional chore for observers. If members also care to send in general bird records for the early part of this year at the same time in order to save postage, these can also be forwarded to recorders.

In particular will secretaries and/or bird-recorders for affiliated local societies please collect as many records as possible from their members, or draw this to their attention and remind them to send records?

Some 75 letters of acknowledgement have been sent out following the response from the public to the press request for information. It is hoped, therefore, that members and affiliated societies will not regard it as a discourtesy if their letters are not acknowledged individually, and so help to keep postage costs down.

In addition to dates, numbers of birds, place seen, it will be helpful if any notes can be supplied as to food taken, behaviour etc.

ALL WAXWING RECORDS PLEASE, IMMEDIATELY, if you wish to ensure their inclusion, to R. F. Dickens, Ridgefield, Glasshoughton Hill, Castleford, Yorks.

CHISLETT MEMORIAL LECTURE

The seventh Chislett Memorial Lecture was given on Saturday, 20th March 1971, at 6.30 p.m. in Doncaster Grammar School. A large audience greatly enjoyed James Alder's lively account of his work over many years with the Dippers on Devil's Water — a 30-mile network of streams flowing into the Tyne. The President, Athol Wallis, in introducing the speaker reminded us of Ralph Chislett and his work.

During the morning, members of the Doncaster and District Ornithological Society showed some thirty visitors round Potteric Carr and Sandal Beat Y.N.T. Nature Reserves. Three Garganey on Potteric Carr were the highlight of this visit.

In the afternoon three papers were given: Dr. Theakston's lecture on deer was ably read, in his unavoidable absence, by Dr. D. Aspinall; Mr. H. E. A. Rippingale of Wakefield told us about his bird watching and illustrated this with slides; Mr. John Knight of Guisborough concluded the afternoon meeting with a selection of slides explaining his work with badgers.

The chairman for the afternoon session was Mr. Neil Cowx.

M. WEEDEN and S. WHITE

Birds of Prey Enquiries, 1964 and 1967 by **Derek B. Cutts**. Bulletin of the Hull Scientific and Field Naturalists' Club, April. 1970. Pp. 48. 3/6d.

This useful booklet summarises results of the kind of co-operative surveys which can conveniently be organised within a society or club, which should commend themselves as complementary to the customary type of ornithological annual reports and may well provide an alternative to the latter if their bulk of repetitive material and unwieldiness create insuperable problems in getting them into print.

The Hull Society undertook a survey of Kestrel, Tawny Owl and Barn Owl in 1964 for the whole of the East Riding, as part of a wider enquiry. At the same time they collected records also of Little Owl. Better coverage was obtained in 1967 by concentrating on eighteen of the 10 km. squares nearest to "base".

Among points discussed are the dangers that distribution of observers rather than of observed may be represented; that greater concentration on a smaller area in 1967 and resulting higher numbers could be interpreted as an increase in birds. Results of a number of chemical analyses are included and ringing and recovery details are listed. The standard practice in presenting these would have been an improvement, as it would also to have had the two maps for each species on opposite pages for ease of comparison. The choice of the two terms Breeding Evidence, and Evidence of Breeding for slightly but not distinctly different things is unfortunate. The total observations for 1967, in appendix, provide evidence of careful organisation, methodical recording and painstaking work.

R.F.D.

FIELD NOTES

Late Breeding of Barn Owl

In dealing with the Barn Owl, *The Handbook of British Birds* (Witherby, Jourdain Ticehurst and Tucker) gives its breeding season as "Usually April or early May, occasionally Feb. and March: also again in July and eggs or young from Sept. to Dec." On checking through Y.N.U. Ornithological Annual Reports I find confirmed breeding of the Barn Owl is infrequently mentioned and there are only four records in the years 1944-1965 inclusive of what might be regarded as late nesting. Later Reports than that for 1965 are not yet to hand at the time of writing.

In 1945, young were snoring in a building at Nunthorpe on 19th October, with both adults in attendance.

In 1946, a late brood near Knaresborough called in the hole until 12th October.

In 1964, birds were feeding young at Gouthwaite on 13th October.

In 1965, the last young left a nest at Rotherham on 30th November.

In his report for the year 1952, Chislett records that birds were hunting by daylight at Esholt on 14th August and at Swillington on 17th September and says that this is "presumptive evidence of hungry young". There are a number of records for December, January, and February (1944, 1959, 1960) of birds hunting in daylight but I am not sure that one can assume that they had hungry young. In view of the paucity of such records the following may be of interest.

On 11th December 1970 I was asked to visit a farm near to Pontefract, where five days earlier an adult Barn Owl had been found early in the morning, severely injured but still alive among some young bullocks. It had died later but was in such a mess that its body had not been saved. I was consequently unable to establish how it had received its injuries. It was not until two days after he had found the adult that the farmer discovered there were three young in the pigeon loft above the bullocks. For the next three days they were apparently not fed, probably making a total of six days without food. The young were obviously becoming progressively weaker.

Late on 11th December he contacted me to ask if I could care for them and I collected the only two which could be found in the dark. One of these was already dead by the following morning. The third bird was collected in daylight on the 12th, and these two surviving ones were force-fed until such time as they themselves would take food provided for them. The resourcefulness of a whole school and the help of various naturalist friends ensured that an adequate supply of mice and dead birds could be kept up.

All three young birds retained some white down as late as this and the youngest of the three in fact was only just beginning to show signs of its first feathers. This would indicate hatching in late November with the egg laid in late October.

I considered it unwise to release these two young birds whilst there was still a possibility of prolonged severe wintry weather, or in their native area where random shooting is all too prevalent. They were finally given their freedom on 25th February 1971.

R. F. DICKENS

Early appearance of *Syrphus balteatus* Degeer.

Syrphus balteatus Degeer, is a distinctive hover-fly which is a widespread and often abundant species occurring chiefly in late summer and early autumn. My own records which are principally from V.C.63 cover the period 9th July to 26th September and the Y.N.U. diptera records for the County are from June to September. It is therefore of interest to record that on 20th March 1971, a day of mild sunny spells, I saw a single female specimen resting on leaves of a Rhododendron at Houghton Wood near Market Weighton.

R. L. Coe (*Handb. Ident. Brit. Ins.*, 10 (1), Syrphidae. Roy. Ent. Soc. Lond. 1953), records the flight period of this species as February-November with a January example taken in a conservatory. Seguy (*Dipteres Syrphides de l'Europe Occidentale. Mem. Mus. Nat. d'Hist. Nat. Ser. A*, xxiii, 1961), gives May-October and says the larvae hibernate. It is obvious that some adults also hibernate and presumably the specimen I saw was an overwintering example.

I am obliged to Messrs. P. Skidmore and L. N. Kidd for helpful correspondence and research in entomological literature on my behalf.

ROY CROSSLEY

Two Rare Oligochaete Worms in the River Trent.

Limnodrilus profundicola (Verill) (1871) and *Pristina idrensis* Sperber (1948) (Anneida, Oligochaeta) which so far have been recorded in only a few restricted localities in Britain (Brinkhurst, 1963; Brinkhurst and Kennedy, 1965; Kennedy, 1965) have now been found in the river Trent. *L. profundicola* was first recorded in Britain in a small brook in Lancashire (Brinkhurst and Kennedy, 1965) and was subsequently recorded in a number of other localities surrounding Liverpool. Kennedy (1965) suggests that this localised distribution indicates that the species may have been recently introduced into this country via the port of Liverpool. He also suggests (pers. comm.) that the species has spread to the Trent via the canal system which connects this river with the Mersey.

Limnodrilus profundicola was originally found in the Trent at Drakelow (SK 223204) in March 1967 and was subsequently found at Meaford (SJ 887365) in October 1968. Both these parts of the river are heavily polluted by domestic and industrial wastes and dissolved oxygen levels are frequently very low (Annual Report, Trent River Authority, 1968). Since the young of *L. profundicola* are indistinguishable from the young of the more common, *Limnodrilus hoffmeisteri*, it is not possible to estimate the total population density. However, the sexually mature worms of this species can be distinguished and this part of the *Limnodrilus profundicola* population was estimated to have an average density over a year of 21,000 individuals per square metre of river bed in the muddy regions of the Trent at Drakelow.

In the Trent *Pristina idrensis* was found near Rugeley Power Station (JK 063177) in a dredge sample taken in August 1961. The river at this point was recovering from heavy domestic and industrial pollution received further upstream from the Potteries district. Only four specimens were found in the sample, which contained a total of 974 Oligochaetes, most of which were Tubificids. The only previous record of *Pristina idrensis* in Britain is from a small unpolluted stony stream which feeds Lake Trawsfynydd in N. Wales (Brinkhurst, 1963).

This work was carried out at the Central Electricity Research Laboratories Kelvin Avenue, Leatherhead, Surrey and is published by permission of the Central Electricity Generating Board.

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R. J. Aston, *C.E.R.L. Biology Unit, Scientific Services Centre, Ratcliffe-on-Soar Power Station, Nottingham.*

D. H. Davies, *Department of Biology, University of Salford.*

Sounds of My Life by Peter Scott. Playing time 50 minutes. Catalogue No. REC59M. BBC Radio Enterprises. 1970. £1.44.

The BBC Television series *Look and Far Away Look* had a large public composed not only of those interested in nature, but also a considerable proportion of Peter Scott fans. This record will please both groups. Unfortunately, the one reviewed had many minor mechanical defects on one side, and these caused an irregular but annoying series of clicks.

Whether talking about the view from the picture window of his home at Slimbridge, describing the wildlife in Arctic Canada or near the South Pole, Peter Scott holds the listeners attention. For the naturalist his comments contain considerable information and I found his remarks on hereditary traits in Bewick's swans and the world population of greater snow geese most interesting. The wildlife sounds have been obtained by many workers, both in Britain and abroad, and they have been carefully selected, all being of a high order of excellence. As the speaker says, bird calls are very evocative, and for me the recordings of wigeon and long-tailed duck bring back memories of other places and other times. I think that most naturalists will have their own favourites, but at the same time enjoy the whole record.

A.G.

ENTOMOLOGICAL SECTION FIELD MEETINGS 1970

R. CROSSLEY

The meeting held at the Y.N.T. Brockdale Reserve on 17th May was well attended, a dozen or more members and friends being present. The main object of the meeting was to assess the present status of the Speckled Wood (*Pararge aegeria* L.) and Grizzled Skipper (*Pyrgus malvae* L.) but despite a thorough search neither butterfly was located. However, weather conditions were not ideal and we were probably a little early in the season so it cannot yet be concluded that these two species have ceased to occur in that part of the Went Valley.

Insects generally were scarce and few were about during the somewhat chilly, overcast morning, but by mid afternoon conditions had warmed up somewhat and it was pleasant to watch many bees of the genus *Andrena* which were active on a sandy patch of ground at the top of the wood.

The list of species which follows calls for little comment. The bug *Anthocoris gallarum-ulmi* was a rather interesting discovery; this insect lives in the curled leaf galls on elm where it preys on the gall-forming aphids. Mr. J. H. Flint comments that of the beetles collected by Mr. Pullan the only notable ones are *Feronia vernalis* which he does not find commonly in West Yorkshire, and *Barynotus moerens* which may be common where there are large sheets of Dog's Mercury (*Mercurialis perennis* L.), but otherwise would be absent.

The following members have contributed to the list of species: R. Crossley, A. Pullan (coleoptera specimens identified by J. H. Flint), P. Skidmore.

HYMENOPTERA

Bombus hortorum (L.); P.S.
B. lucorum (L.); P.S.
Aglaostigma fulvipes (Scop.); P.S.
A. aucuparia (Klug); P.S.
Dolerus aeneus Hartig; P.S.
Andrena fulva (Schrank); P.S.
A. haemorrhoea (F.); P.S.

DIPTERA

Bibio marci (L.); P.S.
Syrphus ribesii (L.); P.S.
Platychirus manicatus Mg.; R.C.
P. peltatus Mg.; R.C.
P. albimanus Fab.; R.C.
Melanostoma scalare Fab.; R.C.
Cheilosia variabilis (Pz.); P.S.
Rhingia campestris Mg.; R.C.
Eristalis arbustorum L.; R.C.
E. nemorum L.; R.C.
Helophilus pendulus L.; R.C.
Gymnochaeta viridis (Fall.); P.S.
Phaonia goberti Mik.; P.S.
P. errans Mg.; P.S.
Hydrophoria conica (Wd.); P.S.
Hydrotaea dentipes (F.); P.S.
Helina laetifica R.-D.; P.S.
Morellia simplex (Lw.); P.S.

HEMIPTERA HETEROPTERA

Anthocoris nemorum (L.); R.C.
A. gallarum-ulmi (De Geer); R.C.
Dicyphus stachydis Reuter; R.C.
Liocoris tripustulatus (Fab.); R.C.
Orthops campestris (L.); R.C.
Stenodema calcaratum (Fall.); R.C.
S. laevigatum (L.); R.C.

COLEOPTERA

Rhizophagus bipustulatus (F.); P.S.
Adalia bipunctata (L.); P.S.
Coccinella 7-punctata L.; P.S.
Propylea 14-guttata (L.); P.S.
Nebria brevicollis F.; A.P.
Notiophilus buguttatus F.; A.P.
Loricera pilicornis F.; A.P.
Bradycellus harpalinus Ser.; A.P.
Amara plebeja Gyll.; A.P.
Feronia vernalis Pz.; A.P.
F. nigra Schall.; A.P.
F. madida F.; A.P.
Agonum dorsale Pont.; A.P.
A. mulleri Hbst.; A.P.
Philonthus decorus Grav.; A.P.
P. tenuicornis Muls.; A.P.
Rhagonycha limbata Th.; A.P.
Denticollis linearis L.; A.P.
Phyllobius pyri L.; A.P.
P. oblongus (L.); P.S.
Barynotus moerens F.; A.P.
Athous haemorrhoidalis (F.); P.S.

LEPIDOPTERA

Euchloe cardamines (L.)
 (Orange Tip); A.P.
Pieris napi (L.) (Green Veined White); A.P.
Nymphalis io (L.) (Peacock); A.P.
Aglais urticae (L.) (Small Tortoiseshell); A.P.
Allophyas oxyacanthae (L.) (larvae); A.P.
Erannis defoliaria (Clerck) (larvae); A.P.
Eriocrania semipurpurella (Haus) (larvae); P.S.
Tortrix musculana Hb.; P.S.

The attendance at the meeting held at Richmond on 6th September was very poor, only four members being present. Nevertheless, the outing proved to be a most enjoyable occasion and a number of new vice-county records, and one new county record were obtained. Before lunch the riverside woodland and meadows near Lownethwaite Bridge were worked and in the afternoon we visited the hillside and woodland near Whitcliffe Scar. Mr. Flint comments that Richmond is so far down the dale that only a few upland, northern insects are likely to be found and these chiefly along the river bank. This did indeed prove to be the case, the majority of the insects taken being representative lowland species.

We are most grateful to Mrs. Holloway for her helpful advice in the selection of areas to visit.

Records have been contributed by the following: E. W. Aubrook, R. Crossley, J. H. Flint. New records for V.C. 65 are indicated thus * and the new county record thus †.

HYMENOPTERA

**Mellinus arvensis* L.; J.H.F. A strong colony in the river bank.

Tenthredo livida L.; J.H.F.

DIPTERA

**Pherbellia scutellaris* von Roser; R.C. (teste P.S.).

**Syrphus albostratus* Fall.; R.C.

**S. labiatarum* Verr.; R.C.

Orthoneura splendens Mg.; R.C.

Cheilosia bergstammi Beck.; R.C.

HEMIPTERA HETEROPTERA

**Pentatoma rufipes* L.; J.H.F.

**Tingis cardui* (L.); E.W.A.

Anthocoris confusus Reut.; R.C.

A. nemoralis (Fab.); R.C.

A. nemorum (L.); R.C.

**Nabis rugosus* (L.); R.C.

Temnostethus gracilis Horv.; R.C.

Bryocoris pteridis (Fall.); R.C.

Plagiognathus chrysanthemi Wolff; J.H.F.

Dicyphus epilobii Reut.; R.C.

D. stachydis Reut.; R.C.

Blepharidopterus angulatus (Fall.); R.C.

Malacocoris chlorizans Pz.; J.H.F.

Lygus rugulipennis Popp.; J.H.F.

**Liocoris tripustulatus* (Fab.); R.C.

Lygocoris pabulinus (L.); R.C.

L. contaminatus (Fall.); R.C.

Orthops cervinus (Herrich-Schaeffer); R.C.

Stenodema holsatum F.; J.H.F.

**S. laevigatum* (L.); R.C.

Saldula scotica Curt.; J.H.F.

S. c-album Fieb.; J.H.F.

HEMIPTERA HOMOPTERA

The following records are contributed by J. H. Flint.

Aphrophora alni Fall.

Philaenus spumarius L.

Neophilaenus lineatus L.

Idiocerus confusus Flor.

Iassus lanius L.

Deltocephalus pulicaris Fall.

**Errastunus ocellaris* Fall.

Allygus mixtus F.

Cicadula persimilis Edw.

Macrosteles sexnotatus Fall.

**M. viridigriseus* Edw.

Alebra albostrigata Fall.

Dikraneura mollicula Boh.

**Kybos rufescens* Mel.

Empoasca flavescens F.

Eupteryx notata Curt.

Ribautiana ulmi L.

Cixius nervosus L.

**C. cunicularis* L.

†*Issus coleoptratus* F. (coll. R.C.).

COLEOPTERA

Dromius quadrimaculatus L.; E.W.A.

**Pteryx suturalis* Heer; E.W.A.

**Megarthus depressus* Pk.; J.H.F.

Ocyusa incrassata M.&R.; E.W.A.

Triplax aenea Schall.; E.W.A.

Calvia 14-guttata L.; J.H.F.

Rhinosimus planirostris F.; J.H.F.

Geotrupes stercorarius L.; J.H.F.

Batophila rubi Pk.; E.W.A.

**Apion haematodes* Kirby s. *cruentatum* Walton; E.W.A.

Pleasure from Insects by Michael Tweedie. Pp. 172 with 17 plates and many line drawings by Joyce Bee. David and Charles: Newton Abbot, 1971. paper covered edition, 90p.

The issue of a moderately priced paper-back edition of this rather appealing book (reviewed in *The Naturalist* 1969, 105) is to be welcomed. How much hard wear it will stand is another matter but it should teach the budding entomologist to develop a delicate touch.

R.C.

BOOK REVIEWS

Introduction to Fungi by John Webster. Pp. viii and 424, with 242 figures. Cambridge University Press. 1970. £3.00 net.

It would be idle as well as dishonest for this reviewer to pretend that he could be entirely impartial in his attitude to this book. The author will be well-known to many readers of this review, for he has been for many years now a distinguished member of the Y.N.U. Mycological Section, and until his recent appointment as Professor of Biological Sciences at the University of Exeter was a regular and prominent figure at our Forays. Many of us have known for some time that this book was in gestation and have awaited its appearance with some impatience. It is therefore something of a relief to find that partiality is not needed, for John Webster has produced what in one vital aspect at least is a quite superb book.

In an unusually interesting preface, the author tells us that he has "long been convinced that the best way to teach mycology, and indeed all biology, is to make use, wherever possible, of living material". I believe that John Webster would further agree with me in the opinion, now apparently rather unfashionable, that a biologist must first know something of the structure and reproduction of the organism which he wants to study before he is properly fitted to enquire into the inner secrets of its metabolism, for he has produced what is essentially a text in the classical style, albeit one with an unusual authority derived from the authenticity of its illustrations.

Of the 242 figures, 47 are composed of photographs. The great majority of the rest are entirely original line illustrations drawn from life by the author. This is in itself a formidable and admirable achievement, and a welcome change from the too prevalent copying in text books of older figures, often reproduced with suspect fidelity. The glory of this book lies in the very high quality of these drawings which establish a new standard of excellence for an undergraduate textbook of mycology. In this respect none of its rivals remotely approaches this new book, which for this reason alone would be a most valuable addition to the literature. Let the prospective purchaser look for example at the illustrations of *Erysiphe*, *Entomophthora*, *Exidia* and *Tremella*, or the stages of basidium development in *Oudemansiella*, and he will appreciate the reasons for my enthusiasm.

The teaching of mycology has always been bedevilled somewhat by problems of classification and the situation is as confused today as it ever was, with seemingly as many different classifications as there are texts. Webster's solution to this problem is to adopt the "General Purpose Classification" of Ainsworth, a prudent and perhaps far-sighted choice since this does employ the now standardised terminations for the higher categories of taxa (e.g. Sub-division *Ascomycotina*) and though in some cases this results in names which are at present unfamiliar, they will surely be less so to future generations of mycologists. A virtue of this system is the splitting of the "Phycomycetes". Those forms with zoospores (chytrids and oomycetes) are placed in one Sub-division, *Mastigomycotina*, and those having non-motile aplanospores (zygomycetes) in another Sub-division, *Zygomycotina*. It has long been evident that older treatments giving equal status to *Phycomycetes*, *Ascomycetes* and *Basidiomycetes* obscure the much greater fundamental diversity of forms associated together in the first group than in either of the other two. Furthermore, Webster's treatment makes it very plain that the *Mastigomycotina*, including as it does three quite distinct types of zoospore flagellation, is clearly itself an unnatural assemblage.

This is not a balanced treatment of the fungi. To be fair, the author makes no such claim and indeed says that he has "tried to write an introduction to fungi which are easily available in the living state" and again, "the problem of what to include has been decided on the criterion of ready availability". Thus the *Laboulbeniales*, of seductive fascination though so rarely seen, appear in the initial classification but not in the text. This selective treatment has its compensations in that more space is available for other things, there being for instance an outstanding treatment of *Synchytrium*, and *Gasteromycetes* receive more sympathetic attention here than in other texts. The policy is however perhaps carried too far. I regret the virtually total omission of *Acrasiomycetes* and *Myxomycetes*. The latter omission is difficult to understand, for the criterion of ready availability cannot exclude the slime moulds and one would like to have seen what Webster's draughtsmanship would have produced

in illustration of such a beautiful genus as *Arcyria*. However, at this point the student is specifically referred, with typical candour, to Alexopoulos's *Introductory Mycology*, where the *Myxomycetes* and their allies are particularly well-treated by an expert on these remarkable organisms.

Alexopoulos's book must surely be the most highly regarded student text presently available and John Webster's book invites comparison with it, being of comparable size and scope. In fact the two books are very different and the more one compares them the more one is convinced that the contrast is deliberate. Alexopoulos's text is easier to consult, being laid out in a more convenient form, and its coverage of the subject is more even but lacks the depth of treatment achieved in parts of Webster's book. Webster's life cycle diagrams are stark and entirely plain, without the little vignettes that are such an attractive and useful feature of Alexopoulos's book, but taken as a whole the illustrative material in the latter does not compare in quality with that in the new book. The truth of the matter is that these two excellent books are complementary to one another and fortunate indeed will be the student who has access to both. The realities of student life forces one to conclude that most students will purchase neither, but opt instead for one of the much smaller and slighter introductions available today. Nevertheless, at the published price this new volume is decidedly good value for money. I do not know whether or not the publishers presently intend to introduce a soft-cover version, but I believe that such an edition might well be an outstanding success.

John Webster cares about quality of teaching, about accuracy of observation, and about tungii. In this book it shows. J.D.L.

British Fungus Flora: Agarics and Boleti. Boletaceae, Gomphidiaceae and Paxillaceae by Roy Watling. Pp. 125 with 108 drawings. H.M.S.O. 1970. £2.50.

The second part of this work — and the first part to deal with its subject at the species level — appears nearly a year after the publication of the introductory part. As the latter was not issued until more than eighteen months after the dating of its preface, future parts seem likely to follow as a slow trickle rather than a flow.

Eighty species are dealt with in this part, sixty-eight of which fall within the Boletaceae in which ten genera are recognised as compared with seven genera in the British Mycological Society's Check List; species of the additional genera — *Aureoboletus*, *Leccinum* and *Suillus* — being included in *Boletus* in the Check List where fifty-two species were listed for the family. The generic name *Gyrodon* is replaced by *Uloporus*.

The keys and descriptions are precise, incorporating microscopic characters of spores, cystidia and cap cuticle, and chemical reactions of flesh, while the macroscopic data are commendably free from purely relative terms. Synonyms, references to reliable illustrations, habitat information and a concluding paragraph referring to the outstanding characteristics of the species and the most reliable features which serve to distinguish them from related or other species with which confusion is most likely, complete each account. The line illustrations are clear and will be of particular value in giving added distinctness to the verbal descriptions of microscopic characters. A useful list of mycorrhizal relationships of the species is given in the appendix where there is also an hierarchic arrangement of subgenera, sections and subsections though this is not followed in the text where the arrangement both of the genera and of the species in each genus, is alphabetical.

This work sets a high standard in descriptive systematic mycology. One fears however that its completion, if ultimately achieved, is only likely to be realised in the distant future.

W.A.S.

Country Talk by J. H. B. Peel. Pp. 221. Robert Hale. 1970. £1.80.

This is a collection of edited short essays which originally appeared in a national newspaper and few of them have any natural history content. They are the reflections and philosophy of a countryman covering a wide range of subjects including such widely differing topics as a defence of the grammar school system and a vivid description of dawn breaking over Stonehenge.

I found this a very enjoyable book and, as one would expect of a poet, the prose style is lively and at times quite compelling. It is an excellent bedside companion.

R.C.

The Flora of Monmouthshire by A. E. Wade. Pp. 236 with two photographic plates and two maps. National Museum of Wales, Cardiff. 1970. £2.25.

Of the Welsh counties only Anglesey, Flint and Radnor are smaller than Monmouthshire but only Glamorgan and Caernarvonshire contain a greater number of species. Geologically the rocks belong mainly to the Coal Measures in the western part and the Old Red Sandstone in the east with relatively small, but botanically significant, areas of Carboniferous limestone in three or four widely separated areas. There is a diversity of habitats from the salt marshes of the Severn estuary to the upper moorland reaches of the Black Mountains. Limestone and siliceous grasslands are both represented but much of the natural woodland has been felled and replanted by the Forestry Commission with inevitable damage to the flora and the best of the peat bogs is drying out and deteriorating botanically. The richest areas are the lower Wye Valley, the district about Abergavenny and the coastal levels bordering the Severn estuary. The former area was well covered by Shoolbred's *Flora of Chepstow* (1920) but the only pre-existing Flora for the county as a whole, issued in 1908, was inadequate even at the time of publication.

Perhaps the most notable species in the county is *Euphorbia serrulata* (*E. stricta*) which was formerly plentiful over a considerable area about Tintern but which is now said to be rare there, partly as a consequence of replanting with conifers. The occurrence of an outlying western population of Hornbeam in the Wye valley is particularly interesting but the problematical Pear near Monmouth, formerly referred to *Pyrus cordata*, is so named by Mr. Wade without comment despite the categorical statement in Clapham, Tutin and Warburg's Flora that "plants from the Wye valley reported as this species are referable to *P. communis*".

The format of the book follows the traditional lay-out of Floras. The chief botanical features of the five districts into which the county is divided are described in the introduction and all records are referred to these divisions in the body of the work. Grid squares are nowhere mentioned. Casuals and mere garden outcasts are not distinguished typographically from native species. There is a disappointing dearth of supplementary information following the bare bones of distribution. The *Sorbus* trees of the Wye valley are surely amongst the most interesting species in the county but there are no comments here on their morphology, ecology or present status, or even indeed of any records for *S. anglica*, *S. eminen*s or *S. × vagensis* later than Shoolbred's. If these have suffered at the hands of the Forestry Commission the facts should surely have been recorded. It is conceded that *Thelypteris palustris* and *Ramischia secunda* are probably extinct in the county but of how many more is this also true? Is it sufficient for example to cite "*Bromus madritensis* L. Roadsides and wood borders; rare. Native. 4. Piercefield Woods, Lightfoot, 1773" and to leave it at that? As Mr. Wade's interest in the flora of the county dates from 1925 one might reasonably have expected a fuller treatment. The nature of a work of this kind precludes its ever being definitive; but some accounts are much better than others and this one will hardly rank higher than a useful example of its kind which fills another gap in the list of County Floras.

W.A.S.

Units of Life: Cells and Unicellular Organisms by Richard Gliddon. Pp. x + 79 with 8 plates and 32 text figures. Heinemann Educational Books Ltd., London. 1970. 50p.

This excellent little book is one of a series of Heinemann Investigations in Biology. It deals with various aspects of cell biology that can be studied by simple investigations on protozoans and higher organisms. All the studies are designed for individual or class work by sixth-formers, students in colleges of education, and first-year undergraduates, using the sort of equipment such students would have readily available. Among the biological phenomena recommended for study are permeability of red blood cells; narcosis of ciliates; uptake of sulphate and phosphate by *Chlorella*; pinocytosis, phagocytosis and osmoregulation; amoeboid, flagellar, ciliary and axopodial movements; behavioural responses to gravity, chemicals and light; cell growth, competition and association; gamete activity, fertilisation and pollen germination; and embryonic development in *Xenopus*. Sources of material are suggested and methods of laboratory culture are outlined. Experimental conduct is clearly described, with some guide to expected results, but the student is also led on to selected background reading and to the design of further experiments for possible project work. The whole approach is interesting and thought-provoking and should make cell biology come alive for even the most blasé student. Highly recommended to teachers and amateur microscopists alike.

G.F.L.

A Field Guide to the Snakes of Southern Africa by V. F. M. Fitzsimons. Pp. 221 with twelve colour plates and twenty plates of black and white photographs. Collins, 1970. £2.10.

A Field Guide to the Birds of Southern Africa by O. P. M. Prozesky. Pp. 350, with thirty two colour and eight black and white plates. Collins, 1970. £2.50.

These two books are the two latest field guides to the region and it may not be inappropriate to review them together. As guides to two diverse animal groups they allow interesting comparisons.

The study of reptiles, particularly of snakes, has reached a high level of sophistication in tropical and sub-tropical regions, and this is reflected in this guide. With species ranging from highly venomous to beneficial in an agricultural context, the group needs a protagonist who can combine science with sympathy, and this the author does very well indeed. The plates illustrate 94 of the 138 species and principal racial forms of the area and are a feature of the book. Those in colour are beautiful and the black and white photographs are also of extremely high quality. To me this is a model of what reptilian field guides should be. From the key based on colour characters to the tabulated distribution chart it is very well done. The introduction, which contains basic snake biology as well as hints on snake-bite treatment, could well be included as an appendix to every field manual for use in Southern Africa — whether primarily herpetological or not.

The bird guide inspires rather less confidence, in me at least. For many years Roberts' *Birds of South Africa* has been the standard single volume guide to the region and the present work, in my opinion, leans too heavily on it. The bird fauna of the region is large, with over 800 species of which 411 are illustrated here, but other field guides which cover sometimes a whole continent have solved the problem of compression better. The field identification of birds has been, in the last seventy years or so, very much a European and North American monopoly, though field guides have ramified since the 'fifties. Perhaps these could now be classified according to the level of sophistication reached by field observers. If so, then later editions of this book may reach the highest levels.

In conclusion, may I say that anyone visiting Southern Africa without these two books, is bound to miss something interesting. As a pair they are useful additions to the field guide coverage of the continent. T.M.C.

The Behaviour of Birds, Mammals and Fish by S. M. Evans. Pp. 60 with 14 plates and 15 text figures. Heinemann Educational Books Ltd., London. 50p.

This is an excellent little book about practical animal behaviour at sixth form, college of education or undergraduate level.

The scope is necessarily limited for it is confined for the most part to one example of each group of animal — to zebra finches, mice and guppies. These are all very good laboratory animals and serve very well to illustrate the types of problems which can be investigated for each group. The book is full of ideas and the student carrying them out will learn a good deal of basic animal behaviour as well as being stimulated to pose and answer other questions. The methods of recording and presenting results are not forgotten so that this book is good value for money.

I.W.

Signals for Survival by Niko Tinbergen and Hugh Falkus. Pp. 80. Clarendon Press, Oxford University Press. £2.00.

In 1969 a film of the same title was awarded the Italia Prize for television documentaries and this book appears to consist either of stills from that film or similar photographs with an explanatory text by the makers of the film and accompanying drawings by Eric Ennion.

The photographs and text give a masterly account, as would be expected from the leading authority in this field, of the behaviour of the Lesser Black-backed Gull throughout the year. The drawings on the other hand add very little to the analysis except perhaps an increase in price. Dr. Ennion's ragged lines can in fact be downright misleading in instances where an important part of the display pattern is the sleekness of the plumage. This is however the only account of this type which has been published in book form and as such will be extremely valuable to all who wish to know the meaning of the actions of birds.

I.W.

Among Animals of Africa by **Bernhard Grzimek**. Pp. 368 with 52 colour photographs. Collins, London. 1970. £2.50.

Professor Grzimek's book is a splendid example of attractively written scientific natural history. There are nineteen lively and well-informed chapters on most of the more striking animals of Africa and their habits — the main predators and their prey, along with elephants, rhinos (black and so-called white), camels and gorillas among the mammals, with in addition ostriches, crocodiles, some snakes and the locust — and for anyone visiting that continent for the first time on one of the justifiably popular trips to the game reserves, this book would greatly enlarge the pleasure of the visit. However, although other work is freely quoted, the book is mainly valuable as a personal account of the experiences of the author, a man with an intense interest in and love of animals and an enthusiastic conservationist. He is also an admirable photographer, so that the consistent level of excellence shown by his colour photographs can rarely have been achieved. A word of praise should also go to the publishers for their highly accurate reproduction of the illustrations in a well-made and clearly printed volume at a price which nowadays can be considered very reasonable

T.K.

Living and Fossil Brachiopods by **M. J. S. Rudwick**. Pp. 199 with 99 text figures. Hutchinson University Library. 1970. Hardback £1.90. Paperback 80p.

The author states at the outset his intentions to narrow the information gap that exists between palaeontology and zoology, in connection with the phylum Brachiopoda. This book is therefore viewed as an addition to existing literature rather than as a replacement and is in fact useful to both disciplines in bringing together information not normally covered by the specialist texts. Of the wide range of aspects covered those dealing with relation to the substrate and ecology are particularly useful to the palaeontologist, whilst the section covering evolutionary history should be of interest to the zoologist. The book is comprehensively illustrated with line drawings, although the evolutionary charts would have been easier to read had they had a simple time scale, particularly for readers unfamiliar with the geological time scale. At its price this book represents a useful addition to any private or institutional library.

W.J.V.

Terrestrial Slugs by **N. W. Runham** and **P. J. Hunter**. Hutchinson University Library, 1971. Hardback £2; paperback 80p.

Slugs are always present in the immediate neighbourhood of any school and though readily available are often neglected. This book will enable the keen biology teacher to take advantage of these members of the environment and use them more fully in his curriculum. At the same time it will appeal to the average naturalist.

The contents of the book range comprehensively over "general features, classification, metabolism in all its aspects, and ecology, with a special section on slugs as pests". Each topic is clearly described and a wide bibliography is appended. The photographs are all black-and-white but show clearly the points desired and the line drawings are always adequate. The authors are to be complimented on the inclusion of so much recent material. Papers published as recently as 1970 are mentioned; such references are particularly useful to naturalists and schoolmasters.

Conchologists would do well to take note of the statement in the preface which reads — "there is a need for further information at all levels from the simplest natural history to the most sophisticated physiology and ecology, and in all countries". This should encourage both amateurs and professionals to greater endeavours.

E.D.

Evidence and Deduction in Biological Science, edited by **P. J. Kelly**. Pp. 472 with 256 figures and plates. Nuffield Advanced Science Series. Penguin Books. 1970. £1.50

This study guide has been designed to supplement the four laboratory guides in this series. It is so organised that cross reference to the relevant chapter in the corresponding laboratory guide is rapid and easy. The material included covers a wide range from the presentation of research data to historical and social aspects of biology. It provides a wealth of evidence which the sixth form student can explore theoretically but related to practical work in the laboratory. There are many problems to be considered.

It is used extensively, as intended, the student could not fail to acquire some insight and understanding of the way in which science proceeds. It will be invaluable to any biology teacher at Sixth form level.

M.S.G.

African Birds of Prey by Leslie Brown. Pp. 313 with 23 photographs and many line drawings. Collins, 1971. £2.25.

One does not have to know the African birds of prey to enjoy this eminently readable book. The author has a great deal to say about predators in general; the chapter on Behaviour and Physical Adaptations of Predation is both informative and thought-provoking. I found the section dealing with the uses of sight and hearing in prey detection most interesting.

When we come to the birds of the title, it is interesting to note that more than a quarter of the species mentioned nest in Europe. Most of them also nest in Africa, while others are only known there as migrants. My own experience with some of these birds varies from that of the author, but it is reasonable to assume that habitat and climate can affect behaviour. One should avoid being too dogmatic about this sort of thing, but some passages in this book are not totally free from dogmatism.

There is no doubt that Leslie Brown writes from first-hand experience of most of the species described, and some of them he has studied in great depth, as his remarks on the Crowned Eagle's breeding biology prove. When one considers the vast area involved, this study on birds of prey is very comprehensive, but as one would expect there are a few species mentioned about which little is known. However, from correspondents in Africa I know that the number of bird watchers there is increasing and no doubt the gaps will be gradually filled.

The figures in the text, whether illustrating species, physical characteristics, food requirements or distribution, are well drawn and convey information clearly, while the photographs — many of them taken by the author — average a very high standard of excellence.

This is a very well produced book and one that contains a great deal of information without ever being dull

A.G.

Common Australian Birds by Alan and Shirley Bell. Pp. 218, with 117 coloured drawings. Oxford University Press, 1970 (revised edition). £3.75.

This is a small book at a rather high price. The selection of birds to be covered was made by the authors after extensive travels in Australia, so can be taken as an "average" degree of frequency over the whole country. As a first book for a new bird-watcher in Australia (that is either new to the subject or the country) this would be ideal.

Each bird species is given brief coverage of distribution and recognition features and is illustrated on the opposite page. In addition each bird has a short essay on its general habits and characteristics. The drawings on the whole would be helpful to the beginner — but one hopes that loss of its broad yellow wing bar has not afflicted every Goldfinch which emigrated to the Antipodes, as it has the one illustrated in this book.

T.M.C.

Aldabra Alone by Tony Beamish, with a Foreword by Sir Julien Huxley. Pp. 222 with 24 plates. George Allen and Unwin, 1970. £2.50.

To most people — and even to many naturalists — Aldabra was unknown until the glare of publicity was focussed on it by the ill-conceived project of establishing a joint Anglo-American airfield there. A greater act of scientific vandalism would be hard to envisage, for Aldabra is unique, a living natural history museum. No other coral atoll in the world combines so rich a wild life evolved in isolation, with so little interference by man. The destruction of so priceless a treasure house of natural history, built up over countless thousands of years, for purely short-term strategic advantages, would have been a scientific crime of the first magnitude. Fortunately the scandal was publicised before the disastrous scheme was pushed through and devaluation eventually got the responsible politicians off an awkward hook.

This very readable and admirably illustrated account of a visit to Aldabra in 1967 gives a vivid picture of its remarkable bird and animal life and the equally remarkable, not to say formidable, difficulties of the terrain. The giant tortoises are estimated to number at least 80,000 and the island is probably overpopulated with them in relation to the regeneration of the trees and scrub on which they browse. More than 60 species of birds are recorded and of the 35 species which breed there twelve are endemic. The flora also includes at least 10% of endemic species.

Officially Aldabra has been reprieved rather than saved but a much wider awareness of the tragedy which was so narrowly averted will, one hopes, help to prevent a repetition of such disastrous planning.

W.A.S.

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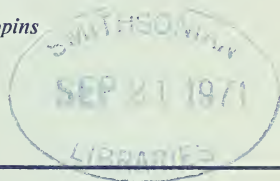
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Annual Meeting, 9th October 1971, in the Department of Zoology, Leeds University. Exhibits and notes on the year's work. Election of officers and other business. Members should bring sandwiches.

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THE MOUNTAIN HARE (*LEPUS TIMIDUS* L.) IN THE PEAK DISTRICT

D. W. YALDEN

The history of the mountain hare, *Lepus timidus*, in the Peak District has been documented by Stubbs (1929) and Hewson (1956), and earlier comments were made by Coward and Oldham (1910). The species must have been native in the area at some time in the late or post Pleistocene, for its remains have been recovered from at least three of the caves in the area (D. Bramwell, *pers. comm.*). However, it died out subsequently, perhaps in the climatic amelioration at around 4000 B.C. (West 1968), and its recent history starts with a number of introductions in the latter half of the 19th century. An unknown number were released at Penistone about 1870, 20 at Saddleworth about 1876, and about 50 at Greenfield around 1880 (Hewson 1956). Stubbs (1929) remarks that there is no information on the factors controlling the distribution of the species, although "so far as one could tell, there was no difference either in the climate or the vegetation" between moors inhabited by and uninhabited by mountain hares.

In the present paper my own sight records of this species have been analysed in an effort to clarify the factors underlying the distribution of the species in the Peak District. In addition, the distribution seems to have changed somewhat since the accounts by Stubbs and Hewson, so an up-to-date record is in order.

METHODS

My own records of sightings of mountain hare commenced in 1967. Each sighting is dated, the altitude noted and a four-figure grid reference of the locality recorded. Brief notes on the colour phase of the hare, and the vegetation it was in, have also usually been recorded. Records in the earlier years were obtained rather haphazardly, but from August 1969 to March 1971, each one kilometre square of moorland in the High Peak has been surveyed for red grouse *Lagopus lagopus*. Thus any bias in these results due to repeated visits to one site has been minimised (though not entirely eliminated). There could still be some bias due to visiting some moors in winter when the hares are conspicuously white, but this is considered unlikely to distort severely the generalizations which follow.

In order to clarify some of the features of the distribution of the mountain hare, and to provide a comparative note, the sight records of the brown hare *Lepus capensis* L. (inc. *L. europaeus* Pallas) are also analysed. These have not been gathered in anything like such a geographically systematic manner, being mostly chance sightings during surveys for other species of animal, particularly red grouse *Lagopus lagopus* and mole *Talpa europaea*. In addition there is a definite bias because one third of the records came from one limited area of grouse moor which I visit frequently. Since this militates against some of my deductions this bias may for the present be overlooked, though not ignored.

The tail colour of hares seen in marginal areas (*L. timidus* lower down, *L. capensis* on *Calluna* moor) was carefully checked, and doubtful sightings ignored. *L. capensis* has a black tail top, while *L. timidus*, even in summer, has an all white tail.

DISTRIBUTION

The present distribution of the mountain hare in the Peak District is shown in Figure 1 and some attempt is made to enumerate the sightings as well. It is evident that there are two main centres of distribution. A western group stretches along the north side of the Kinder plateau, along Ashop Clough, and across to Chunal and Park Hall Moors. An eastern group of sightings covers the eastern side of the Bleaklow plateau (the western slope of the Derwent Valley), and the eastern slope of the High Peak from the Thurstlestone and Langsett Moors in the north, through Harden, Midhope, Howden and Bradfield Moors, Derwent Edge, Derwent Moors and south on Hallam Moors at least to Friar's Ridge. There are in addition just a few sightings elsewhere on the Bleaklow plateau, from the neighbourhood of the Chew Reservoir, and on Saddleworth Moor.

In addition to my own sightings, Mr. F. Heardman has been kind enough to prepare a map of his "recent" sight records (post 1963), and Mr. T. H. Riley, of the City of Sheffield Museums, has allowed me to use the records deposited with him, particularly by members of the Sorby Natural History Society. While these records increase the scatter on the map slightly, it is clear that in their general distribution they conform to the pattern indicated above.

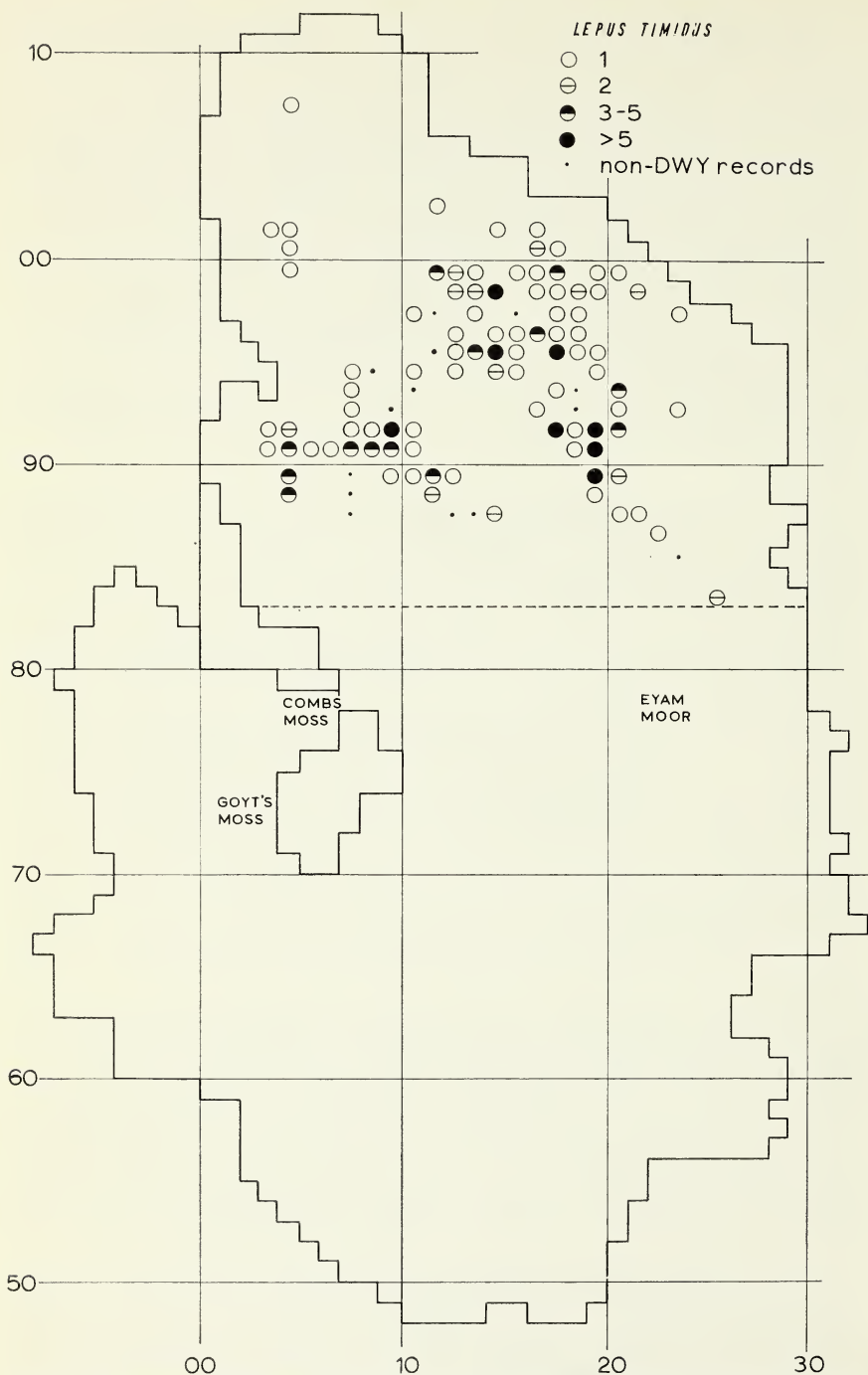


FIG. 1. Recorded distribution of *Lepus timidus* in the Peak District, post 1963. On this and subsequent maps the 10 km. squares of the National Grid are shown and a "squared" outline of the Peak National Park.

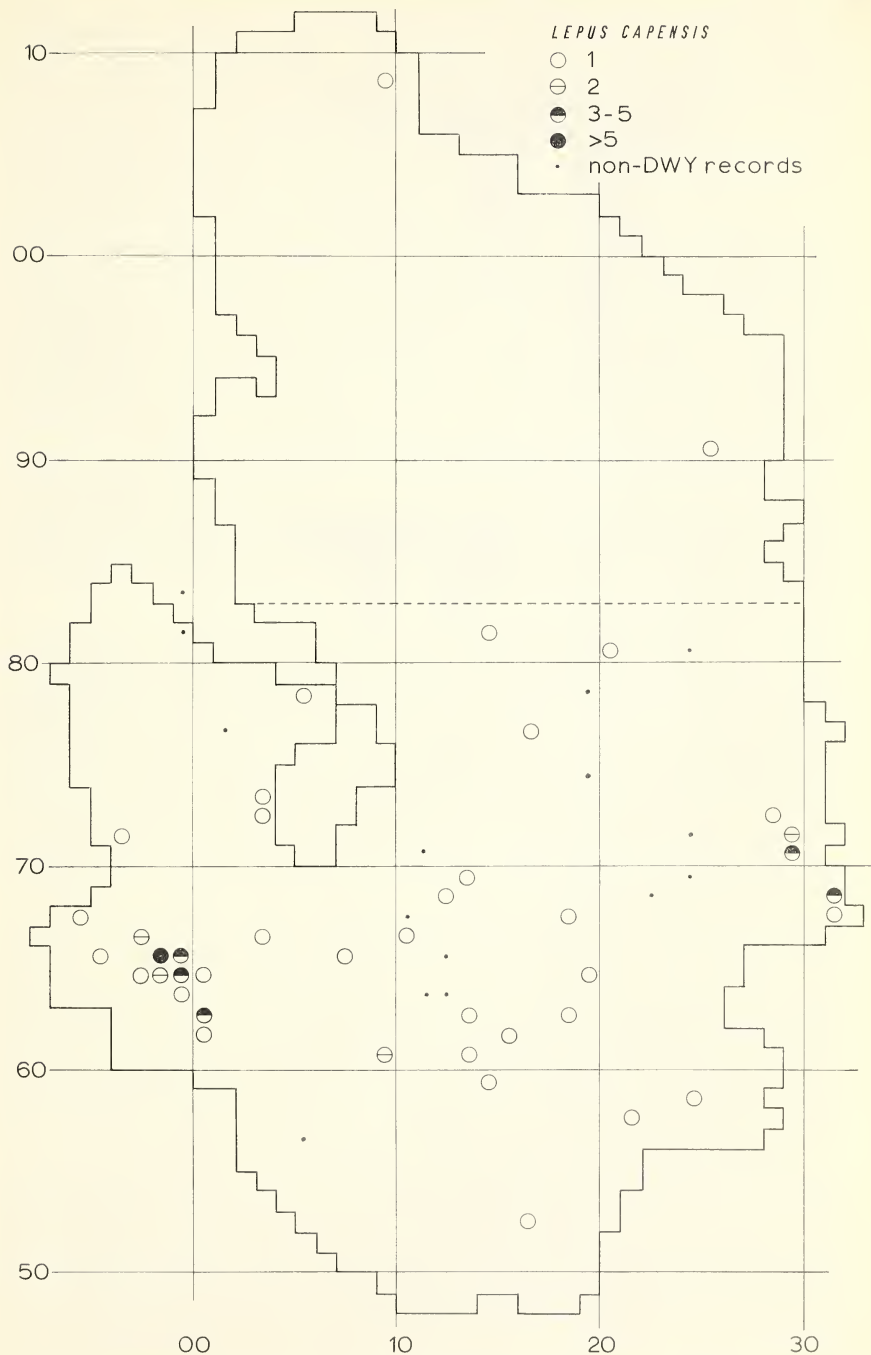


FIG. 2. Recorded distribution of *Lepus capensis* in the Peak District, post 1965.

It is noteworthy that the distribution so recorded for *L. timidus* is rather more restricted than was indicated by either Stubbs (1929) or Hewson (1956). In the north, there are no recent records from the Holme Moss — Black Hill area, despite several searches, and indeed only two recent records from Cheshire. I have not ranged north beyond the Peak National Park, so I cannot say whether the species still occurs on Blackstone Edge. In the south, there are no recent records from either Combs Moss or Goyt's Moss, and the keepers on those moors (Mr. B. Lomas and Mr. J. Roberts, respectively), insist that there have never been any in the last 70 years! As Hewson has remarked to me (*in litt.*, 25 Aug. 1969) this would dispose of not only his records but also those of Stubbs! Unfortunately, the original data on which Hewson based his paper have been lost, and the observer who supplied these data, Mr. J. Armitage, has no note of them either. However, Mr. Armitage (*in litt.* 11 Nov. 1969) did tell me that his fieldwork in the area extended from 1924 to 1953; this suggests that the records he passed to Hewson were not recent, and I wonder whether they may have been perhaps 30 years old. There is no doubt that mountain hares did occur on these moors, for Coward and Oldham (1910) mention a number seen on Danebower, just south of Goyt's Moss. I feel that there is equally no doubt that mountain hares have not occurred on either Goyt's Moss or Combs Moss in the last decade. The other southern area mentioned by both Stubbs (1929) and Hewson (1956) is Eyam Moor, on the eastern side of the Peak District. Again, there are no recent records of the species from that locality, and it seems likely that it is now extinct there as well.

An interesting contrast to this distribution is provided by the equivalent map for the brown hare, *L. capensis* (Fig. 2). While all of the sightings for *L. timidus* lie north of Castleton or the A.625, nearly all the records for *L. capensis* lie south of that latitude. I am not suggesting that the brown hare is not in the High Peak, indeed I am reliably informed that there are brown hares in Edale (F. Heardman) and in the upper Derwent Valley (A. Simpson), but they are certainly not common, and probably confined to lower altitudes — most of my time has been spent on the plateau.

ALTITUDINAL DISTRIBUTION

Since one of the common names of *L. timidus* is mountain hare, one might expect it to be found at higher altitudes than *L. capensis*. That this expectation is realised to some extent is shown by the histograms, Fig. 3. The 163 sightings of *L. timidus* range from 900 to 1850 feet with a mean of 1410 feet (280-570 metres, mean 420 m.) while 73 sightings of *L. capensis* range from 400 to 1600 feet, with a mean of 1084 feet (115-500 metres, mean 330 m.). It is evident, however, that there is a large overlap in the altitudinal range of the two species. Moreover, the distribution of the two species has already been shown to be essentially allopatric, with *L. timidus* in the north, which includes the higher ground, and *L. capensis* in the south, which is relatively rather lower. It could therefore be argued that the apparent altitudinal distinction of the two species is merely a reflection of their different distributions, and that each species is merely occupying the land available to it.

To examine this proposition further, it is necessary to have some measure of the heights of land available, ideally perhaps a mean height for each one kilometre square in the Peak Park. As a reasonable approximation to this, the highest contour in each one kilometre square has been noted, and the altitudinal distribution of these one kilometre squares is also shown on Fig. 3 as an outline. The boundary between the High Peak (*L. timidus* area) and the Low Peak (*L. capensis* area) has been taken as the grid line 383 which passes through Castleton (i.e. approximately latitude 53° 20' 30"N). This method of evaluating the altitude naturally overestimates the height of the land somewhat, especially in steeply sloping areas, but has less effect in plateau areas and at the extremes of low and high altitude. In fact, the maximum altitudinal range within a single one kilometre square is about 600 feet, so this method may over-estimate the "mean height" of a square by up to 300 feet, but usually by much less.

With this additional information, Fig. 3 shows that the two species are tending to use the land available. The land in the High Peak is bimodal in its distribution, with plateaux at about 1300 feet and 1700 feet and the mean at 1420 feet; the distribution of the mountain hares is similarly bimodal. Thus the mountain hares are living mainly on, or perhaps on the slopes immediately below, these plateaux. It is difficult to be certain of this last suggestion, not only because of the lack of precision in estimating land height but also because the hares are much easier to see when they are on a slope; nevertheless, the impression is gained, from the field, that steep rocky slopes are favoured. One other point made by these histograms is noteworthy, the scarcity of mountain

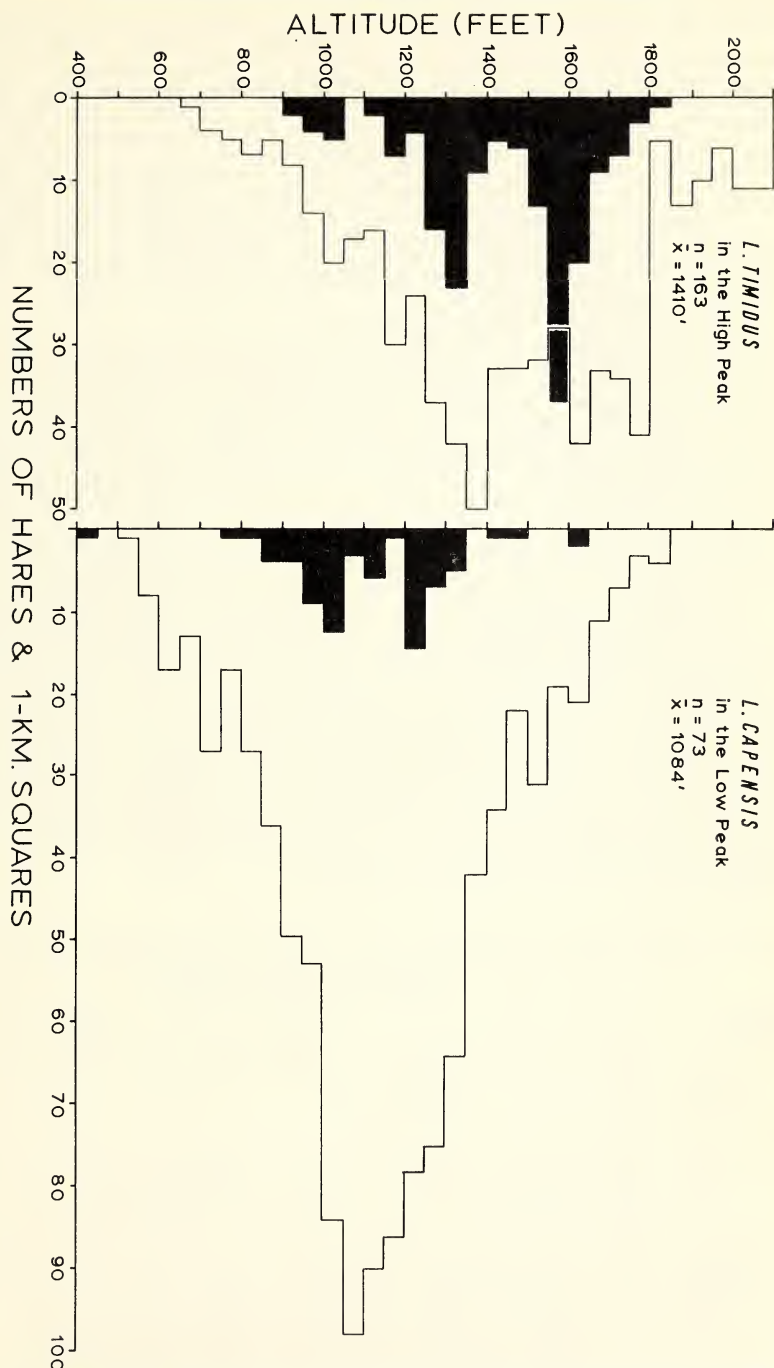


FIG. 3. Altitudinal distribution of hares seen in the Peak District, and (outline) of the terrain (see text for further explanation of the derivation of the latter outlines).

hares on the very high plateaux, Bleaklow, Kinder and Holme Moss, at above 1850'. While, again, I would not suppose them to be entirely absent, as this histogram suggests, they must be sparse, for all of the squares at this altitude have been examined.

By contrast with the above, the land in the Low Peak has a skewed unimodal distribution, with the mode at 1050 feet, and the mean at 1120 feet. The altitudinal spread of the sightings of *L. capensis* do not fit this quite so neatly, though in part this may reflect the sampling bias already mentioned. The mean height of the brown hare sightings is 1084 feet and of the Low Peak 1120 feet; that of the mountain hares is 1410 feet and of the High Peak 1420 feet. One could therefore maintain the argument that the two species are distributed altitudinally according to the land available. Perhaps if more sightings of *L. capensis* in the northern part of the Peak District were obtained, it would be found that where the two species co-exist, the altitudinal separation is more marked, but this certainly cannot be demonstrated on the present evidence.

DISTRIBUTION AND VEGETATION

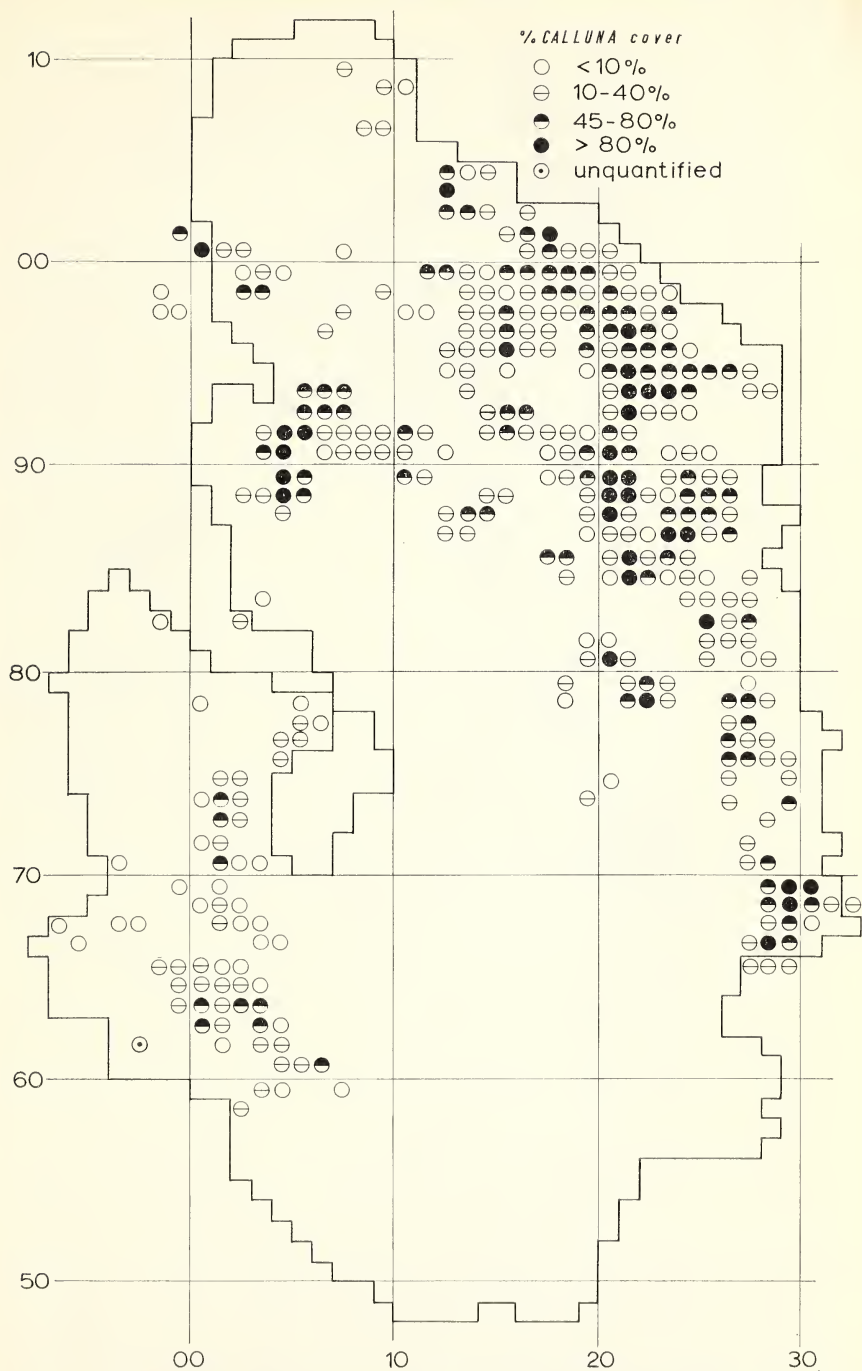
During the course of surveying the moorlands of the Peak District for mountain hares and red grouse, notes have been kept of the predominant vegetation in each one kilometre square. This has been recorded on a subjective assessment of the percentage cover of the various species, and since there are 100 hectares (250 acres) in each one kilometre square, this acts as a record of the area, in hectares, covered by the plant species. Careful notes have been taken of the cover of *Calluna vulgaris*, and also of the amounts of other woody species (*Vaccinium myrtillus*, *V. vitis-idaea*, *Empetrum nigrum*) and *Eriophorum* species (*E. vaginatum* primarily) with less rigorous notes of various grasses (*Molinia*, *Nardus*, *Festuca*). These data are sufficient to analyse the records of *L. timidus* with respect to vegetation, and also to analyse many of the records of *L. capensis*; the remainder of the records of the latter are from the Derbyshire limestone areas, which are almost pure sheep pasture with very little arable farming, and these records can therefore be ascribed to 100% grassland areas with reasonable confidence.

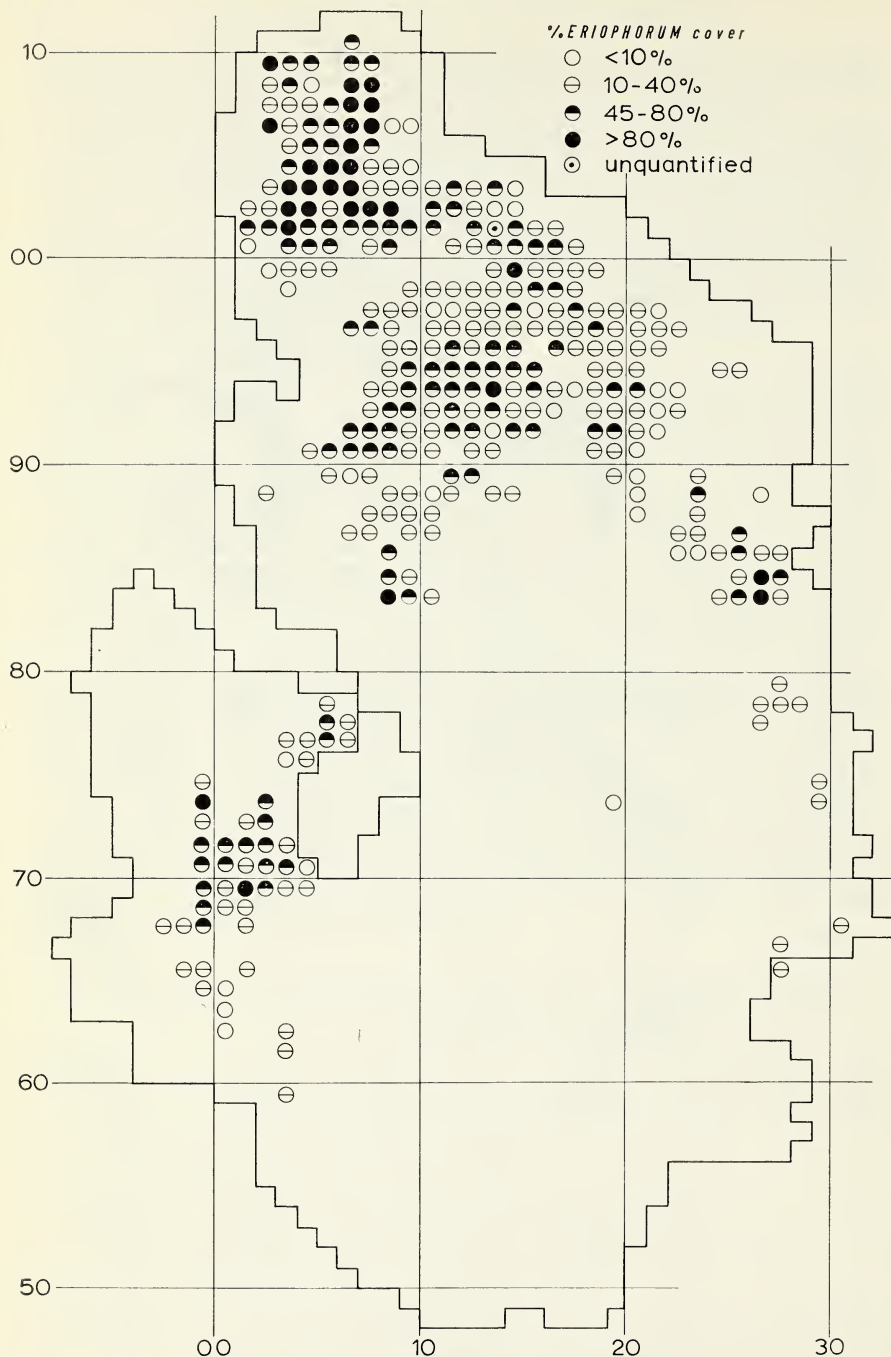
The distribution of *Calluna vulgaris* and *Eriophorum* sp. in the Peak District is shown on the maps, Figs. 4 and 5. If Fig. 4 (*Calluna*) is compared with Fig. 1 (*Lepus timidus*) it is evident that there is some fair measure of association between the two in the High Peak, though obviously no such association is evident further south. An analysis of the results, however, (Fig. 6 and Table 1) shows that while very few mountain hares were seen in squares devoid of *Calluna* few were found in pure *Calluna* areas either. Equally, while none were found in pure *Eriophorum* areas, only 23% were found in areas completely lacking *Eriophorum*. The only clear indication is the aversion to pure grassland areas (including in these managed sheep pasture as well as areas of *Molinia*, *Nardus*, etc.) and the clear preference (50% of the sightings) for areas completely without grass. It seems, then, that while the mountain hare appears to be associated with *Calluna* areas in a general sense, it is a mixture of *Calluna* and *Eriophorum* which provides its favoured habitat.

TABLE 1

Number of hares seen in one kilometre squares of the vegetation type indicated.

Species	Percentage Vegetation Cover											Total
	0	-10	-20	-30	-40	-50	-60	-70	-80	-90	-100	
<i>Calluna</i>												
<i>L. timidus</i>	14	20	20	30	26	9	18	19	3	9	7	175
%	(8)	(11)	(11)	(17)	(15)	(5)	(10)	(11)	(2)	(5)	(4)	
<i>L. capensis</i>	37	7	1	10	9	6						71
%	(52)	(10)	(1)	(14)	(13)	(8)						
<i>Eriophorum</i>												
<i>L. timidus</i>	40	21	17	18	29	13	4	15	17	1	—	175
%	(23)	(12)	(10)	(10)	(17)	(7)	(2)	(9)	(10)	(1)		
<i>L. capensis</i>	56	5	8	—	1	—	—	—	—	—	—	71
%	(79)	(7)	(11)		(1)							
Grassland												
<i>L. timidus</i>	87	15	31	14	12	1	5	3	2	5	—	175
%	(50)	(9)	(18)	(8)	(7)	(1)	(3)	(2)	(1)	(3)		
<i>L. capensis</i>	—	1	1	13	9	1	2	3	4	2	34	71
		(1)	(1)	(18)	(13)	(1)	(3)	(4)	(6)	(3)	(48)	

FIG. 4. Distribution and percentage cover of 1 km. squares for *Calluna vulgaris*.

FIG. 5. Distribution and percentage cover of 1 km. squares for *Eriophorum* sp.

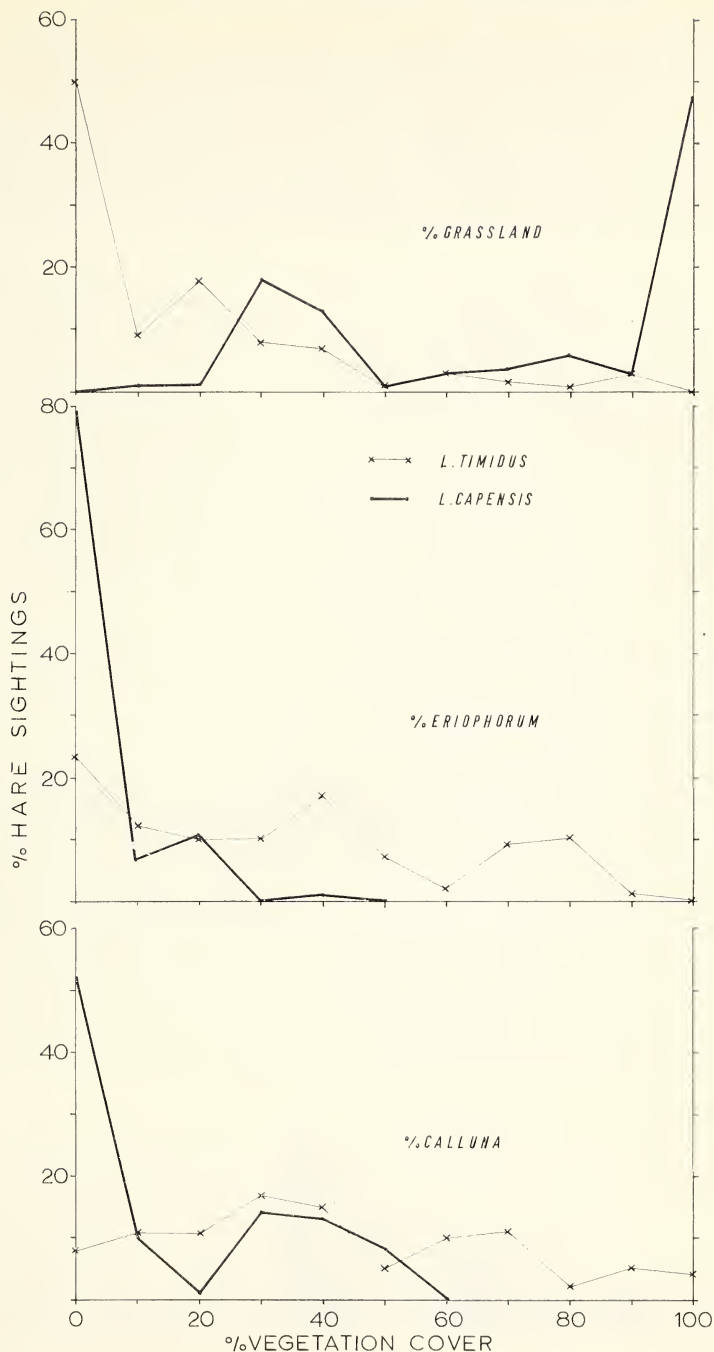


FIG. 6. Proportions of hare sightings plotted against the amount of *Calluna*, *Eriophorum* and grassland in the squares where the hares were seen.

By contrast, the habitat preference of the brown hare is rather clear cut. Over 75% of the sightings were from non-*Eriophorum* areas, none were seen in areas with more than 50% *Eriophorum*. Equally, despite the bias caused by me searching *Calluna* areas for red grouse, and therefore also often finding brown hares on *Calluna* moors, 52% of the sightings were from areas without any *Calluna*, and there were no sightings in squares with more than 60% *Calluna* cover. On the other hand, there were no sightings in squares with no grassland, and 48% of the sightings were in pure pasture; the overall preference of the species for grassland seems very clear. The small peak of records in areas which are a mixture of *Calluna* and grassland is partly due to the bias, already mentioned with respect to *L. capensis*, induced by repeated visits to one locality.

STATUS

Hewson (1956) suggested that, at the time he was writing, the mountain hare was more abundant in the Peak District than in much of Scotland, but he was unable to give any figures for density. Neither has it been possible to census the mountain hare during the present survey, only repeated visits to a number of sample areas could achieve this. However, some indication of its abundance may be gained from the numbers seen per one kilometre square (Table 2) and the numbers seen in one days walking. The best figure recorded for a single square so far is 13 (sk 1991, 14 March 1971); the best figure for one day's walking (about 6 hours, and covering parts of 14 one kilometre squares 14 March 1971) is 34. These figures scarcely compare with the density of up to 78 per 100 ha (228 hares on 292 hectares) recorded by Flux (1970a) in north-east Scotland. However, Watson and Hewson (1963) show densities of under 2.5 per 100 ha over most of the north-west Scotland, and the present density of mountain hares over the whole of the High Peak is comparable with this. Taking the area as 612 km.² (an exaggerated figure based on one kilometre squares entering the Peak Park) the density as recorded is about 0.3 per 100 ha; taking just the squares where hares were seen, it is about 1.8 per 100 ha.

TABLE 2

Numbers of mountain hares seen per one kilometre square per visit.

Number of hares seen	1	2	3	4	5	6	7	8	9	10	11	12	13
Number of squares with stated number of hares	61	21	8	3	2	2	1	—	—	—	—	—	1

The species certainly seems less common now than it has been in the past in the Peak District. The game bag records of the Manchester Corporation Waterworks show that in 1934, 119 hares were shot on Arnfield Moor and 131 on Crowden Moor, that is 250 on about 3,400 hectares (7.4 per 100 ha) in an area which has yielded only two sightings in recent years; while there are a few still living in the area, there are certainly not 250! Probably declines of this sort reflect the decline in keeping, and consequently in the management of *Calluna*, since 1939. However, there has undoubtedly been another, further, decline in recent years (since Hewson's account) due to the severe winter of 1962-63. Govett (1964) records over 20 dead ones found, near Langsett Reservoir, 23 March 1963 (c. sk 2099) and over 50 dead around Bull Clough, 24 March 1963 (c. sk 1795). Similar numbers were found dead on Birchinlee Pasture by Mr. A. Simpson (*pers. comm.* August 1970). Probably the species is only now beginning to recover its numbers; four of the six records from the extreme north west date from spring 1971, in localities where previous searches failed to find any hares. This may therefore represent a genuine spread aided by the very mild 1970-71 winter.

COLOUR CHANGE

The ability of *L. timidus* to change its coat colour when it moults in the autumn and again in the spring is probably its best known feature, and has been the subject of much study, most recently by Flux (1970b). While my own notes do not bear comparison with the detailed fieldwork carried out by Flux, it does seem worth while recording the main times of colour change. Unfortunately, no attempt was made to record the colour of each hare in the detailed manner used by Flux, hares were just noted as mainly white, brown, or obviously "piebald". Equally, it has not been possible to maintain even sampling throughout the year; in particular, there are gaps in the holiday periods of September and December and in the examination — field course period of June-July. The records (Fig. 7) show that most mountain hares in the Peak

District are white from January through to early April (perhaps from December onwards) and brown from late May to November; there is a fairly lengthy changeover period in late April — early May, but insufficient evidence on the winter change. Clearly there is scope here for a lot more observation, perhaps by someone resident on the eastern side of the Peak District with easier access to the numerous population on the Derwent Edge area. In general, the more extended spring change agrees in time and duration with that recorded by Flux (1970b). It is possible that the winter moult is a little later than in Scotland, but much more information is required. Hewson (1958) points out that the winter temperatures at Buxton are within 2°C of those at Braemar (at the same altitude) and any marked difference between mountain hares in Scotland and the Peak District is unlikely.

DISCUSSION

The main interest of these results lies in the possible reasons, the cause and effect, for the distributions of *L. timidus* and *L. capensis* in the Peak District. There is a fairly clear geographical separation, with *L. timidus* in the north and *L. capensis* in the south; an altitudinal difference of about 400 feet, with *L. timidus* occurring higher; and a vegetational difference, with *L. timidus* occupying mainly areas of mixed *Calluna-Eriophorum* vegetation, and *L. capensis* occupying mainly grassland. These differences are, of course interrelated, not independent; the northern part of the Peak District is higher, and consists mainly of *Eriophorum-Calluna* moorland. Is it possible to separate out the most important factors?

The altitudinal overlap between the two species is considerable, and within the present range of altitudes does not seem likely to be conclusive. The vegetational difference may be more significant. Flux (1970a) and Hewson (1962) have shown that in winter the main food in Scotland is *Calluna* (80-90% of the diet) and that *Eriophorum* is an important subsidiary food (10-15%). In summer, *Calluna* is less important (20-50%), *Eriophorum* remains about as important as in winter, and grasses (*Agrostis*, *Festuca*, *Deschampsia*) become more important (up to 60%). Walker and Fairley (1968) reported the winter diet of the Irish race to be primarily *Calluna* (28%), *Eriophorum* (15%) and grasses (44%). Thus the preference of *L. timidus* in the Peak District for areas of mixed *Calluna-Eriophorum* moorland could be a simple food preference and the main explanation for the observed distribution. This could explain also their apparent absence above 1850 feet, where much of the vegetation is *Empetrum* and *Eriophorum*, or the surface is bare peat. Unfortunately, this cannot be a complete explanation; one has also to explain the apparent aversion to grasslands when the various authors quoted find grasses to be important food plants, at least in summer, and an explanation is also required for the apparent disappearance of the species from presumably suitable habitat on Combs Moss and Goyt's Moss. It is possible that grassland areas are by and large unsuitable because they do not provide suitable cover for the hares to lie up in during the daytime (it is worth noting that the majority of sightings have been made in the middle of the day, rather than dawn or dusk, when the hares were lying up, not feeding). Alternatively the suitable grasses, mainly *Festuca*, are so heavily grazed by sheep that the available grassland may be unattractive. Data on the food of mountain hares in the Peak District is obviously needed.

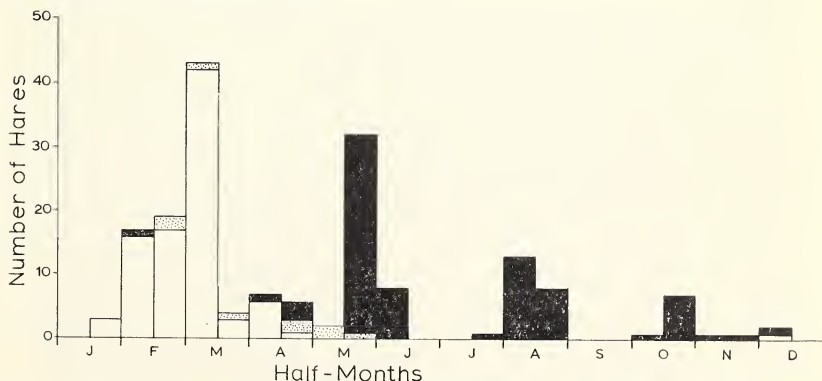


FIG. 7. Colour phases of *L. timidus* seen in each half month. (White — winter coat; black — summer coat; stipple — "piebald").

The loss of mountain hares from the southern areas is more puzzling. The only worth-while suggestion I can make is that as these are small areas, their mountain hare population would have been rather small, and was wiped out in one of the severe winters, perhaps 1947 or 1963. Their isolation from the main areas of mountain hare population would explain the failure of the species to recolonise them.

The distribution of *L. capensis* can best be explained by the principle of competitive exclusion. This species does occur on *Calluna* moorland in the southern part of the Peak District (though always near grassland) as well as in the pasture areas more usually associated with the species. Hence it would appear that its absence from *Calluna* moorland further north results from its exclusion by *L. timidus*, or, conversely, that it is only able to inhabit *Calluna* moorland in the southern Peak District in the absence of *L. timidus*. Unfortunately, there appears to be no systematic information available on the food of *L. capensis* even in Europe, and there is certainly, as yet, no information on its food on these *Calluna* areas.

SUMMARY

- (1) At present, the mountain hare in the Peak District is confined to the area north of the A.625, particularly on the slopes around the Derwent and Ashop valleys. By contrast, the brown hare is found mainly in the south.
- (2) There has been some retraction of range when compared with the reports of previous authors.
- (3) Altitudinally, the mountain hare has been seen between 900 and 1800 feet, while the range of the brown hare extends from 400 to 1600 feet. These differences may just reflect the altitude of the ground available.
- (4) Botanically, the mountain hare prefers mixed *Calluna-Eriophorum* moorland while the brown hare favours grassland.
- (5) The highest density of mountain hares so far observed is 13 per 100 hectares.
- (6) The simplest explanation for the different distributions of the two species is that *L. timidus* is confined by its food preferences to areas of mixed *Calluna-Eriophorum* vegetation, and that *L. capensis* is unable to compete successfully with *L. timidus* in such areas. This may not however be the complete, nor even the correct explanation.,

ACKNOWLEDGEMENTS

I must thank a number of correspondents who have supplied me with records of hare sightings or with information, in particular F. Heardman, J. Armitage, T. H. Riley, W. A. Caulfield (for Manchester Corporation Waterworks), Miss S. Evans, D. Bramwell, R. Jones and A. Simpson. I owe R. Hewson particular thanks both for interesting discussions of various points, and for triggering off this work by his 1956 paper.

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THE LEPIDOPTERA OF YORKSHIRE: A COMMENTARY

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1. INTRODUCTION

The revision of the Yorkshire list of Macrolepidoptera compiled by the Lepidoptera Committee of the Yorkshire Naturalists' Union has now appeared in *The Naturalist* (1967-1970) and as a single volume reprint. The compilation of a list of the Lepidoptera recorded in the County over the last sixty-odd years cannot really be justified unless it is used by the active lepidopterists in the County. All too often county lists are used primarily by those lepidopterists who are seeking a particular species and scour the local lists to see where it is to be found; this will be no exception but we hope that collectors will use their discretion with those species that have a tenuous foot-hold in the County. A second frequent use of county lists is that they enable collectors to assess the significance of their records and encourage them to send in all those which the published list indicates will be of value. Such records will of course be most welcome by the County Recorder but we hope that this publication will go even further by encouraging people to search for particular species both in new localities and in districts for which there are only old or doubtful records; section 9 makes a few suggestions in this direction. In section 8 we have reviewed some of the most important (and best known) localities in the hope that we have enough evidence to justify their conservation.

The earlier part of this paper is concerned with an analysis of the number of species in the list and the gains and losses since Porritt's List was published. Gains are instantaneous and largely unpredictable; losses are not easily proved but section 4 includes all those species not seen since the end of 1944, most of which must be presumed lost to Yorkshire but it is to be hoped that a special search may rediscover one or two of them. It was the very active recording taking place in the County in the early 1960's that stimulated the preparation of the revised list, perhaps therefore in another ten years, i.e. in 1980, we should prepare another casualty list: those not seen since 1960. Let it therefore be the objective of all Yorkshire lepidopterists, both resident and visiting, to see that the 1980 casualty list is as small as possible.

2. ADDITIONS SINCE PORRITT'S TIME

Since the publication of the supplement to Porritt's List in January 1904 we have added 33 species to the County List; these are listed below together with the year in which they were first recorded but the other details are not repeated.

<i>Danaus plexippus</i> (Milkweed Butterfly)	1927
<i>Odontotia carmelita</i> (Scarce Prominent)	1968
<i>Tethea ocularis</i> (Figure of Eighty)	1950
<i>Drepana binaria</i> (Oak Hook-tip)	1937
<i>Nola strigula</i> (Small Black Arches)	before 1915

This species was not listed by Porritt but we have no record of its first occurrence.

<i>Earias clorana</i> (Cream-bordered Green Pea)	1962
<i>Amathes ditrapezium</i> (Triple-spotted Clay)	1950
<i>Diarsia florida</i> (Marsh Square Spot)	1900
but not identified until about 1950	
<i>Procus latruncula</i> (Tawny Minor)	

Only recently separated

<i>Apamea ophiogramma</i> (Double Lobed)	1956
<i>Hydraecia lucens</i> (Large Ear)	1923
<i>Hydraecia paludis</i> (Saltern Ear)	1923

These two species were not recognised as distinct in Porritt's time.

<i>Nonagria dissoluta</i> (Brown-veined Wainscot)	1920
<i>Chilodes maritima</i> (Silky Wainscot)	1938
<i>Arenostola fluxa</i> (Mere Wainscot)	1968
<i>Leucania straminea</i> (Southern Wainscot)	1950
<i>Leucania obsoleta</i> (Obscure Wainscot)	1957
<i>Leucania unipuncta</i> (White-speck Wainscot)	1966
<i>Cucullia asteris</i> (Starwort)	1949
<i>Cucullia absinthii</i> (Wormwood Shark)	1953
<i>Polyschrisia moneta</i> (Golden Plusia)	early 1900's

<i>Plusia gracilis</i> (New Gold Spot)	1969
<i>Plusia acuta</i>	1955
<i>Sterrha fuscovenosa</i> (Dwarf Cream Wave)	1948
<i>Scopula emutaria</i> (Rosy Wave)	1905
<i>Anaitis efformata</i> (Short-clasped Treble-bar)	
Only recently separated.	
<i>Rhodometra sacraria</i> (Vestal)	1961
<i>Mesotype virgata</i> (Oblique Striped)	1969
<i>Perizoma bifasciata</i> (Barred Rivulet)	1949
<i>Perizoma minorata</i> (Heath Rivulet)	1915
<i>Eupithecia tantillaria</i> (Dwarf Pug)	1933
<i>Aspitates gilvaria</i> (Yellow Belle)	1951
<i>Semiothisa alternaria</i> (Sharp-angled Peacock)	1949

A review of this list shows that six were added due to "splitting of species", four are recognised migrants, rare in any part of Britain, and probably another six, being single records or thereabouts, may be assumed to be vagrants. The remaining seventeen are now well established in Yorkshire and it would be idle speculation to guess which were here in Porritt's time and remained undiscovered and which have arrived since.

3. SPECIES NOT RECORDED SINCE PORRITT'S TIME

While it is encouraging that we have been able to add 33 species to the list left by Porritt in 1904 we soon realise that the losses are much greater than the gains, there being no less than 64 species in Porritt's list (or his supplement) which have not been recorded in the County since. The full list follows together with an attempt to classify the losses, though this must be largely a matter of conjecture. Porritt himself regarded several of the records he had received as of doubtful authenticity; with our increased knowledge of the habits and distribution of some species we might now regard several of the others as dubious, due either to incorrect identification or occasionally to incorrect locality recording, either when a collector had travelled outside the county and mixed up his specimens or allowed his enthusiasm to add to the county list to overide his honesty.

A second group of species are those which undoubtedly did occur and have apparently become extinct in the County; a few of these might well be rediscovered if a special search is made. It should be mentioned that *Eupithecia inturbata* (Maple Pug) would have been placed in this group had not a special search been made in 1963 at the locality given by Porritt. Thirdly there are the species which are migrants, or vagrants which only occasionally reach Yorkshire, and when they do are not often recorded; so far as is known no work has ever been done to establish what proportion of a migration of some rare and easily identified insect eventually find their way to an entomologist who will record the fact.

<i>Papilio machaon</i> (Swallow-tail Butterfly)	Extinct
<i>Lepidea sinapis</i> (Wood White)	Extinct
<i>Colias hyale</i> (Pale Clouded Yellow)	Migrant
<i>Argynnis lathonia</i> (Queen of Spain Fritillary)	Migrant
<i>Euphydryas aurinea</i> (Marsh Fritillary)	Extinct
<i>Plebejus argus</i> (Silver-studded Blue)	Dubious
<i>Hesperia comma</i> (Silver-spotted Skipper)	Extinct
<i>Hyloicus pinastri</i> (Pine Hawk)	Dubious
<i>Celerio euphorbiae</i> (Spurge Hawk)	Migrant
<i>Cerura bicuspis</i> (Alder Kitten)	Extinct?
<i>Stauropus fagi</i> (Lobster)	Extinct
<i>Clostera curtula</i> (Chocolate-tip)	Extinct
<i>Polyploca ridens</i> (Frosted Green)	Extinct
<i>Dasychira fascelina</i> (Dark Tussock)	Extinct
<i>Euproctis chrysorrhoea</i> (Brown Tail)	Dubious
<i>Lymantria monacha</i> (Black Arches)	Extinct
<i>Epicnaptera ilicifolia</i> (Small Lappet)	Extinct
<i>Utetheisa pulchella</i> (Crimson-speckled Footman)	Migrant
<i>Atolmis rubricollis</i> (Red-necked Footman)	Extinct
<i>Lithosia quadra</i> (Large Footman)	Migrant
<i>Eilema deplana</i> (Buff Footman)	Dubious
<i>Eilema griseola</i> (Dingy Footman)	Extinct

<i>Eilema sororcula</i> (Orange Footman)	Dubious
<i>Euxoa cursoria</i> (Coast Dart)	Extinct
<i>Rhyacia simulans</i> (Dotted Rustic)	Dubious
<i>Triphaena orbona</i> (Lunar Yellow Underwing)	Dubious
<i>Polia tincta</i> (Silvery Arches)	Extinct
<i>Polia nitens</i> (Pale Shining Brown)	Extinct
<i>Eremobia ochroleuca</i> (Dusky Sallow)	Vagrant
<i>Hyppa rectilinea</i> (Saxon)	Extinct
<i>Hydrillula palustris</i> (Marsh Buff)	Extinct
<i>Orthosia miniosa</i> (Blossom Underwing)	Extinct
<i>Graptolitha furcifer</i> (Conformist)	Vagrant
<i>Heliothis scutosa</i> (Spotted Clover)	Dubious
<i>Heliothis armigera</i> (Scarce Bordered Straw)	Migrant
<i>Jaspidia pygarga</i> (Marbled White Spot)	Dubious
<i>Catocala fraxini</i> (Clifden Nonpareil)	Migrant
<i>Laspeyria flexula</i> (Beautiful Hook-tip)	Dubious
<i>Parascotia fuliginaria</i> (Waved Black)	Vagrant
<i>Herminia barbalis</i> (Common Fan-foot)	Dubious
<i>Hypena rostralis</i> (Buttoned Snout)	Extinct
<i>Schrankia taenialis</i> (White-line Snout)	Extinct?
<i>Scopula rubiginata</i> (Tawny Wave)	Dubious
<i>Cosymbia linearia</i> (Clay Triple-lines)	Extinct
<i>Carsia paludata</i> (Manchester Treble Bar)	Extinct?
<i>Mysticoptera sexalisata</i> (Small Seraphim)	Extinct
<i>Lythria purpuraria</i> (Purple-barred Yellow)	Dubious
<i>Ortholitha moeniata</i> (Fortified Carpet)	Vagrant
<i>Euphyia rubidata</i> (Ruddy Carpet)	Dubious
<i>Coenoteophria berberata</i> (Barberry Carpet)	Dubious
<i>Eupithecia distinctaria</i> (Thyme Pug)	Extinct?
<i>Eupithecia dodoneata</i> (Oak-tree Pug)	Extinct?
<i>Bapta bimaculata</i> (White Pinion Spotted)	Extinct
<i>Angerona prunaria</i> (Orange Moth)	Dubious
<i>Istugia carbonaria</i> (Netted Mountain Moth)	Dubious
<i>Itame fulvaria</i> (Rannoch Looper)	Migrant
<i>Ennomos autumnaria</i> (Large Thorn)	Dubious
<i>Lycia hirtaria</i> (Brindled Beauty)	Extinct
<i>Boarmia roboraria</i> (Great Oak Beauty)	Extinct
<i>Ectropis consonaria</i> (Square-spot)	Dubious
<i>Syntomis phegea</i> (Nine Spotted)	Dubious
<i>Dipsospecchia scopigera</i> (Six-belted Clearwing)	Extinct?
<i>Aegeria myopaeformis</i> (Small Red-belted Clearwing)	Extinct?
<i>Aegeria spheciiformis</i> (White-barred Clearwing)	Dubious

4. FURTHER LOSSES IN MORE RECENT TIMES

The fact that more than half the additions to the County List that have been made since Porritt's day have actually been made from 1945 onwards may mean that many species have only found their way into the County in this period, but a more likely explanation is that after the end of the war in 1945 collecting became more systematic and in particular the Mercury Vapour Light came into fairly general use among lepidopterists. If some weight at least is given to the latter argument then particular significance must be attached to the following list of species which while recorded in Yorkshire between 1900 and 1944 have not been seen since. Although some of the 27 species may still survive in an unworked area it seems probable that they are mostly extinct in the county. Two of these were only added to the list in the first part of the century.

<i>Danaus plexippus</i> (Milkweed)	Migrant
<i>Argynnis paphia</i> (Silver-washed Fritillary)	Extinct
<i>Nymphalis polychloros</i> (Large Tortoiseshell)	Extinct
<i>Erebia aethipos</i> (Scotch Argus)	Extinct
<i>Cupidio minimus</i> (Small Blue)	Extinct
<i>Sphinx ligustri</i> (Privet Hawk)	Extinct
<i>Hemaris tityus</i> (Narrow-bordered Bee Hawk)	Extinct
<i>Notodonta anceps</i> (Great Prominent)	Extinct?

<i>Tethea or</i> (Popular Lutestring)	Extinct
<i>Tethea fluctuosa</i> (Satin Lutestring)	Extinct
<i>Asphalia diluta</i> (Lesser Lutestring)	Extinct?
<i>Nola strigula</i> (Small Black Arches)	Extinct
<i>Sarrothripus revayana</i> (Large Marbled Tort)	Extinct?
<i>Miltochrista miniata</i> (Rosy Footman)	Extinct
<i>Zenobia retusa</i> (Double Kidney)	Overlooked?
<i>Rivula sericealis</i> (Straw Dot)	Overlooked?
<i>Brephos notha</i> (Light Orange Underwing)	Dubious
<i>Chesias rufata</i> (Broom-tip)	Extinct?
<i>Acasis viretata</i> (Yellow-barred Brindle)	Extinct
<i>Calocalpe undulata</i> (Scallop Shell)	Extinct
<i>Chloroclysta siterata</i> (Red-green Carpet)	Extinct?
<i>Hydrelia testaceata</i> (Waved Carpet)	Extinct
<i>Epirrhoe rivata</i> (Wood Carpet)	Extinct?
<i>Euphyia unangulata</i> (Sharp-angled Carpet)	Dubious
<i>Eupithecia plumbeolata</i> (Lead-coloured Pug)	Extinct
<i>Cleora lichenaria</i> (Brussels Lace)	Extinct
<i>Zygaena trifolii</i> (Broad-bordered Five-spot Burnet)	Dubious

5. SUMMARY OF SPECIES

Porritt gave tables both in his list and in the supplement to show the number of species recorded in each of the principal families. Since those days there have been changes in the classification used so that some families have changed and some species have moved from one family to another. The following table summarises the changes that have occurred since the publication of Porritt's supplement. The first column reproduces the "as now Known" column given in 1904 but using the classification used in this paper. The additions from section 2 follow and then a total number of species ever recorded in Yorkshire. The last three columns show the reductions that have occurred so that the final column represents those species which have actually been recorded within the last twenty-five years.

Family	Porritt's summary	Additions 1904-1969	All Time Total	Not since Porritt	Last seen 1904-1944	Present Total
Butterflies	48	1	49	7	5	37
Sphingidae	17	—	17	2	2	13
Notodontidae	17	1	18	3	1	14
Thyatiridae	8	1	9	1	3	5
Lymantriidae	8	—	8	3	—	5
Lasiocampidae	9	—	9	1	—	8
Saturniidae	1	—	1	—	—	1
Drepanidae	3	1	4	—	—	4
Nolidae	2	1	3	—	1	2
Hylophilidae	2	1	3	—	1	2
Arctiidae	20	—	20	6	1	13
Noctuidae	198	14	212	12	1	199
Plusiidae	29	3	32	7	1	24
Monocteniidae	4	—	4	—	1	3
Geometridae	207	10	217	18	9	190
Zygaenidae	5	—	5	—	1	4
Syntomidae	1	—	1	1	—	0
Sesiidae	8	—	8	3	—	5
Cossidae	2	—	2	—	—	2
Hepialidae	5	—	5	—	—	5
Total	594	33	627	64	27	536

In cross-checking the numbers with Porritt's totals a number of anomalies have been discovered. Firstly, in Porritt's supplement he deleted a number of species. Three of these although not recorded since have been inadvertently included as "not recorded since Porritt's List"; they should not have been included at all. They are:

Nonagria algae (Reed Wainscot)
Euphyia polygrammata (Many Lined)
Sesia apiformis (Poplar Hornet Clearwing)

Two further species deleted by Porritt have since been recorded and are therefore additions since 1904. These are:

Hadena w-latinum (Light Brocade)

Perizoma taeniata (Barred Carpet)

Finally, Porritt included in his supplement one species among the Geometridae which we now place in the Plusiidae and which escaped mention in the text and in the corrections and additions at the end of the paper. This is:

Parascotia fuliginaria (Waved Black)

It has not been recorded again and is correctly included among the losses, if indeed it ever really occurred.

It is at once apparent that a great many species formerly known in Yorkshire are no longer with us. It is perhaps particularly distressing that we have lost almost a quarter of the butterfly species formerly with us and it is no consolation that 1945 was the last year that *Argynnis cydippe* (High Brown Fritillary) was recorded while apart from a casual migrant no butterfly has been added this century.

Among the moths the casualty rate is highest among the earlier families. Most of the Sphingidae lost were extremely rare but the disappearance of certain Prominents and Lutestrings is difficult to understand, whereas the loss of several Arctiidae, mainly among the Footmen which are lichen feeders, could be directly attributed to industrial and domestic pollution of the atmosphere which has destroyed so many of the lichens particularly those that grow on trees. Of the two large families there must be some significance in the fact that while our losses among the Noctuidae are offset by the gains, those among the Geometridae are nearly three times as great as the gains. There can be no simple explanation of this but the advent of the mercury vapour light must be one of the factors responsible since it is so much more effective in attracting the Noctuidae particularly when used in a trap.

6. SPECIES AT THEIR LIMIT OF RANGE

Many species which are quite well established in Yorkshire are nevertheless found here at the very limit of their distribution, either at the northern limit of species commoner further south or at the southern limit of species common in the North and in Scotland. These species appear to us to be of particular importance, perhaps not so much from the point of view of conservation as those in the next chapter, but certainly there is a need for sustained observation as in this way we shall get an indication over the years of whether a species is extending or contracting its range, and we can then look out for reasons. There is one general qualification to be made here; although the County of Yorkshire reaches to within a few miles of Morecambe Bay it does not quite reach across the country and there are some species for which the geographical limit lies in Yorkshire so far as the east side of the Pennines is concerned, but which extend further north (or south) on the west side; even so we regard the status of such species in Yorkshire as being well worthy of observation.

(i) NORTHERN SPECIES:

This is certainly the smaller group and we are mainly concerned with a few species generally associated with Scotland which are found as far south as parts of Yorkshire but no further. In preparing this list I am indebted to The Derbyshire Entomological Society for confirmation that they do not occur in that County.

Erebia aethiops (Scotch Argus). The history of this butterfly at Grassington and of its subsequent disappearance is well known. Its failure at Wilton after being introduced and temporarily established seems to confirm that Yorkshire is now beyond its range. There are two colonies not far from our border with Westmorland and it is just possible that it still survives on some unexplored hillside.

Coenonympha tullia (Large Heath). Although there are records for north-west Lincolnshire these must be associated with the well known colonies at Thorne Waste and Hatfield Moors, both of which are now threatened. These two localities together with that in Lincolnshire certainly represent the southern limit of the species on the east side of the country although of course it occurs much further south in Shropshire and in Wales.

Phothedes captiuncula (Least Minor). The Grassington colony seems to be the most southern in Great Britain.

Entephria flavicinctata (Yellow Ringed Carpet). An old record for Dovedale has not been confirmed and there is no record of any colony south of that at Grassington.

Perizoma minorata (Heath Rivulet). Again it is the Grassington colony that is the most southerly known in Great Britain though this of course excludes Ireland.

Epione vespertaria (Dark Bordered Beauty). Strensall is the only well known colony in Britain; all other records have been from further north and none indicate a well-established colony as at Strensall.

(ii) SOUTHERN SPECIES

This list is much more extensive, it has been checked with the Biological Records Centre at Monks Wood and I am indebted to Mr. J. Heath for helping me to eliminate three species which the books indicated should be included but which have now been recorded further north. I have also received much information from Mr. J. H. Duddington on the status of most of these species in Lincolnshire.

Gonepteryx rhamni (Brimstone Butterfly). Thinly distributed and mainly in the south-east of the County. The food-plant is uncommon and some of the specimens seen may be vagrants. Askham Bog used to hold a good colony but there are no recent records. There may be a few records from places further north but even Southern Yorkshire now seems to be the limit of its established range, on the eastern side of Britain.

Argynnis cydippe (High Brown Fritillary). Probably receding on the eastern side; not seen in Yorkshire for 25 years but it still occurs in North Lancashire and Westmoreland.

Polygonia c-album (Comma). This has probably already receded southwards out of Yorkshire.

Melanargia galathea (Marbled White). Isolated colonies in the Wolds are of outstanding importance.

Maniola tithonus (Gatekeeper). A few colonies in the south of Yorkshire seem to be maintaining a precarious foothold but it is well established in Lincolnshire. It occurs up the west coast beyond Furness.

Hamearis lucina (Duke of Burgundy). The North Riding colonies are apparently the northern limit on the east though it occurs further north on the west and has been recorded in Dumfriesshire.

Strymonidia w-album (White-letter Hairstreak). The fact that there are no references in the literature to its occurrence further north makes it important that we should rediscover it in Yorkshire and keep it under observation; it is three years since it was last recorded, but not in any quantity.

Pyrgus malvae (Grizzled Skipper). Not now recorded further north.

Thymelicus sylvestris (Small Skipper). Surprisingly, this insect too does not occur north of our County.

Mimas tiliae (Lime Hawk). Another important resident, which reaches the southern part of the County.

Cerura hermelinea (Poplar Kitten). There are no recent records from further north.

Tetthea ocularis (Figure of Eighty). The range has recently extended into Southern Yorkshire, from North Lincolnshire where it is well established.

Orgyia gonostigma (Scarce Vapourer). One of our more important species; some of its habitats are in danger.

Malacosoma neustria (Lackey). Occasionally taken in the south of Yorkshire, but abundant in Lincolnshire.

Gastropacha quercifolia (Lappet). Another rare species in the south of the County.

Drepana binaria (Oak Hook-tip). Since it first reached Yorkshire in 1937 it has evidently spread but has not yet got beyond our boundaries.

Nola strigula (Small Black Arches). The Scarborough records (1915) are probably the most northern in Britain.

Hadena w-latinum (Light Brocade). The Sheffield records in the 1950's represent its northern limit.

Heliophobus saponariae (Bordered Gothic). This downland insect has been recorded in the Wolds and it probably strays from there, it is not known from further north.

Apamea scolopacina (Slender Brindle). Although not uncommon with us it does not seem to range further north.

Nonagria dissoluta (Brown-veined Wainscot). The centre of the County seems to be its northern limit.

Chilodes maritima (Silky Wainscot). Its habitats are similar to those of the last species and again seem to represent its northern limit.

Arenostola phragmitidis (Fen Wainscot). Once again, not found further north, perhaps due to lack of suitable localities.

- Leucania straminea* (Southern Wainscot). As its English name implies it only just reaches Yorkshire.
- Zenobia retusa* (Double Kidney). There is no recent record so it may now have receded southwards.
- Tiliacea aurago* (Barred Sallow). Though well established in certain Yorkshire localities it has not been reported from any further north.
- Cucullia asteris* (Starwort). Our Spurn colony probably represents its limit.
- Cucullia absinthii* (Wormwood Shark). One of our recent arrivals which will surely spread further north in time.
- Catocala nupta* (Red Underwing). This species reached Yorkshire in 1941 and was recorded regularly until 1953 after which it seems to have receded southwards again.
- Lygephila pastinum* (Black Neck). Yorkshire is evidently its northern limit.
- Comibaena pustulata* (Blotched Emerald). Not apparently recorded further north although there are records for four different Yorkshire vice-counties.
- Sterrrha sylvestraria* (Dotted Border Wave). We know of no locality further north than Strensall Common.
- Sterrrha emarginata* (Small Scallop). This species too seems to reach its limit at Strensall.
- Scopula emutaria* (Rosy Wave). There are no records north of Spurn.
- Scopula imitaria* (Small Blood-vein). Only taken three times in forty years, perhaps Yorkshire is really beyond its range.
- Cosymbia annulata* (Mocha). Almost certainly no longer resident in Yorkshire; in Lincolnshire it is found only in the south.
- Philereme vetulata* (Brown Scallop). It has a precarious hold in Yorkshire and this is certainly its limit on the east side of the country though it extends a little further north on the west side.
- Philereme transversata* (Dark Scallop). The same remarks apply but it is well established in one locality.
- Hydrelia testaceata* (Waved Carpet). Has probably now receded southwards out of Yorkshire.
- Euchoeca nebulata* (Dingy Shell). There are few if any records from further north.
- Eupithecia pimpinellata* (Pimpinel Pug). The books give "Southern England". It occurs in Yorkshire but probably no further north.
- Eupithecia extensaria* (Scarce Pug). The Spurn colony is almost certainly the northern limit.
- Eupithecia haworthiata* (Haworth's Pug). Another local species whose range ends in Yorkshire.
- Eupithecia inturbata* (Maple Pug). We can trace no records from north of Yorkshire.
- Anticollis sparsata* (Dentated Pug). Askham Bog is the most northerly record in Britain.
- Cepphis advenaria* (Little Thorn). Its locality in South Yorkshire is its limit; its presence needs confirming.
- Hemerophila abruptaria* (Waved Umber). Although recorded in Durham in the last century, Yorkshire where it is scarce must now be its northern limit in the east.
- Aegeria vespiformis* (Yellow-legged Clearwing). South Yorkshire represents the northern limit for this species.
- Zeuzera pyrina* (Leopard). Not apparently reported further north.

7. SPECIES WITH A PRECARIOUS HOLD IN YORKSHIRE

We next come to a list of species which are known to be firmly established in the County but which are very localised and have only one (or perhaps two) stations. These are the species about which something can perhaps be done. We do not include uncommon species which are probably fairly widespread although never taken in any numbers, as nothing can be done to protect them.

It is suggested that the species listed below should all be kept under careful observation at their known station. Occasional collecting of small numbers is unlikely to be detrimental but excessive collecting should clearly be avoided. A much greater danger however is the destruction of the localities and if there is any chance of this a real search for alternative stations should be made and introduction from the threatened colony might even be considered but only on a carefully co-ordinated basis and this should be well documented.

No butterflies are included in this list though several very nearly qualify. *Strimonidia w-album* (White Letter Hairstreak) may well have a colony worthy of conservation but we do not know its whereabouts; it is many years since *Cupido minimus* (Small Blue)

was seen and it is almost certainly too late to do anything about this species. No less than four members of the *Satyridae* have a very restricted distribution but none are yet confined to one or two localities. Those moths which are so confined are as follows:

<i>Clostera pigra</i> (Small Chocolate-tip)	Strensall
<i>Orgyia gonostigma</i> (Scarce Vapourer)	Thorne & Doncaster district
<i>Comacla senex</i> (Round-winged Muslin)	Askham Bog
<i>Agrotis ripae</i> (Sand Dart)	Spurn
<i>Triphaena interjecta</i> (Least Yellow Underwing)	Spurn
<i>Phothedes captiuncula</i> (Least Minor)	Grassington
<i>Arenostola elymi</i> (Lyme-grass Wainscot)	Spurn
<i>Leucania straminea</i> (Southern Wainscot)	Askham & Skipwith
<i>Leucania obsoleta</i> (Obscure Wainscot)	Skipwith
<i>Leucania littoralis</i> (Shore Wainscot)	Spurn
<i>Gypsites leucographa</i> (White Marked)	Bishop Wood
<i>Orthosia populeti</i> (Lead-coloured Drab)	Bishop Wood
<i>Cucullia asteris</i> (Starwort)	Spurn
<i>Sterrha muricata</i> (Purple Bordered Gold)	Thorne
<i>Sterrha emarginata</i> (Small Scallop)	Strensall
<i>Scopula emutaria</i> (Rosy Wave)	Spurn
<i>Nothopteryx polycommata</i> (Barred Tooth-striped)	Grassington
<i>Philereme vetulata</i> (Brown Scallop)	Selby District
<i>Philereme transversata</i> (Dark Scallop)	Grassington
<i>Discoloxia blomeri</i> (Blomer's Rivulet)	Scarborough
<i>Entephria flavicinctata</i> (Yellow-ringed Carpet)	Grassington
<i>Perizoma minorata</i> (Heath Rivulet)	Grassington
<i>Perizoma taeniata</i> (Barred Carpet)	Grassington
<i>Eupithecia extensaria</i> (Scarce Pug)	Spurn
<i>Anticollis sparsata</i> (Dentated Pug)	Askham Bog
<i>Cepphis advenaria</i> (Little Thorn)	Edlington Wood
<i>Epione vespertaria</i> (Dark Bordered Beauty)	Strensall
<i>Pseudopanthera macularia</i> (Speckled Yellow)	Grassington

8. LOCALITIES OF SPECIAL SIGNIFICANCE

The last section certainly points to the desirability of the preservation of certain localities. Some of these may be in danger and others may not, furthermore the significance of some localities may diminish if additional localities are found for some of our rarer species. It is of course tempting to list all localities where anything significant occurs and it would be nice to see them all preserved but this chapter will try to concentrate on one locality of each general type.

(1) *Spurn*. At the extreme south-east of the County we have a fine combination of sand-hills and salt-marsh with a hinterland which supports such interesting species as *Maniola tithonus* (Gatekeeper) and *Perizoma bifasciata* (Barred Rivulet). On the saltmarsh and along the dykes the Sea Aster (*Aster tripolium*) grows and supports our only colony of *Cucullia asteris* (Starwort). In this area too is the only Yorkshire locality for *Scopula emutaria* (Rosy Wave). On the dry sides of some of the dykes are some of the best patches of Sea Wormwood (*Artemisia maritima*) on which can sometimes be found *Eupithecia extensaria* (Scarce Pug), again the only site in the County for the species. Of the sand-hill species proper we have *Agrotis ripae* (Sand Dart), *Arenostola elymi* (Lyme-grass Wainscot) and *Leucania littoralis* (Shore Wainscot) which are not recorded anywhere else in Yorkshire. There is also *Actebia praecox* (Portland Moth) which does occasionally occur elsewhere.

The peninsular is of course a well known staging post for migrating birds and there is plenty of evidence that migrating insects also rest there. The well-known migrants such as *Vanessa cardui* (Painted Lady) and *Macroglossum stellatarum* (Humming-bird Hawk-moth) bear this out but are of no great significance. It is however significant that our only records for at least four other species are from Spurn. These are not usually regarded as migratory but it seems that all have wandered into the district and failed to establish themselves as the area is well worked and they have not occurred again; these are *Euxoa obelisca* (Square-spot Dart), *Coenobia rufa* (Small Rufous Wainscot) *Aspitates gilvaria* (Yellow Belle) and *Semiothisa alternaria* (Sharp Angled Peacock). It is surprising that only one of these four (*C. rufa*) has been recorded in

Lincolnshire. In addition Spurn is the best locality in the County for *Spaelotis ravida* (Stout Dart), *Heliophobus albicolon* (White Colon), *Eumichtis lichenea* (Feathered Ranunculous) and *Apanea oblonga* (Crescent Striped) while it appears to be our only locality for *Triphaena interjecta* (Least Yellow Underwing) although this species is not normally regarded as especially coastal.

The Spurn Peninsular must be regarded as the most important locality in the whole County if this is to be judged by the number of unique species occurring there.

(2) *Grassington*. Lepidopterists not accustomed to working in Yorkshire may be surprised that it is a drive of over one hundred miles from Spurn to the second selected locality, and this emphasises the tremendous range of habitat that occurs in such a vast county. Like Spurn the area known generally as "Grass Wood" really embraces three different types of habitat and thus once again we find a whole range of species well established there which are seldom if ever seen elsewhere in the County.

The Wood itself is open and supports a well varied undergrowth which thrives on the limestone on which it is situated. In the more open parts of the wood *Erebia aethiops* (Scotch Argus) used to occur though too long ago for many of the present members of the Section to remember seeing it. The two Geometers *Philereme transversata* (Dark Scallop) and *Pseudopanthera macularia* (Speckled Yellow) occur in the wood; the latter although common there is not known elsewhere in the County. It was in this wood among the Ash trees that *Nothopteryx polycommata* (Barred Tooth-striped) was recently discovered; it is its only known locality in Yorkshire.

Above the wood on the open limestone pavings and closely grazed grassland, a most exposed area, there occur two very small moths neither of which is known from anywhere else in the County, these are *Phothedes captiuncula* (Least Minor) and *Perizoma minorata* (Heath Rivulet) while a number of other good species occur among the rocks and bushes on this high ground including *Stilbia anomala* (Anomalous), *Colostygia olivata* (Beech-green Carpet) and *Procris geryon* (Cistus Forester). The rather dark race of *Aricia agestis* (Brown Argus) which occurs here might also repay further study.

The steep and dangerous drop from the high ground into the valley known as Dibb Scar brings us to the third sub-locality at Grassington. This is well known for *Entrephria flavicinctata* (Yellow Ringed Carpet) which is common there while *Perizoma taeniata* (Barred Carpet) which occurs among the rocks and bushes is not so easily taken. It was the only recorded night visit to this spot which revealed that *Apamea furva* (Confused) was also quite common there.

Grassington is certainly a good second after Spurn but the species established there seem much less likely to be disturbed.

(3) *Strensall Common*. By virtue of its being the only well established locality in Britain for *Epione vespertaria* (Dark Bordered Beauty) Strensall Common must come high on the list of important sites. In the same general area of the Common where *E. vespertaria* occurs there are also to be found regularly *Closteria pigra* (Small Chocolate-tip), *Enargia paleacea* (Angle Striped Sallow), *Sterrhia sylvestraria* (Dotted Bordered Wave) and *Sterrhia emarginata* (Small Scallop). With the exception of *E. paleacea* all these species feed on low growing plants and repeated burning of the heather must threaten their existence.

(4) *Askham Bog*. This well known locality, much in the news due to proposals to drain it, at least partially, is important as the stronghold of *Comacla senex* (Round Winged Muslin) and *Anticollis sparsata* (Dentated Pug).

(5) *Bishop Wood*. This large mixed wood is well known for many species of interest but its unique feature is the amount of Poplar growing there, and undoubtedly this explains the presence of *Orthosia populeti* (Lead-coloured Drab) which is seldom recorded elsewhere in the County. The closely related *Gypsites leucographa* (White Marked) is found only in this wood so far as our records show.

(6) *Thorne Waste*. Another area whose character is being changed; it is the only known station for *Earias clorana* (Cream Bordered Green Pea) and *Sterrhia muricata* (Purple Bordered Gold). In addition to these two little moths it has supported an important colony of *Coenonympha tullia* (Large Heath) and has also been the source of several interesting records of southern species which just reach this part of Yorkshire.

(7) *Reed Beds*. The additions to the County list in recent years include an impressive number of Wainscots but these have not all come from one area and many of them have been found in more than one place. A systematic study of the under-mentioned reed beds, together with any others which appear promising, may therefore

reveal a wider distribution of some of our rarer Wainscots and establish which if any justify special steps towards conservation.

Aberford	Askham Bog	Fairburn	Pilmoor
Scarthingwell	Skipwith Common	Kilnsea	Strensall

(8) *Other Localities*. To single out six localities from such a large area perhaps implies that few other districts are worthy of study. This is far from the case but the six selected are those from which records have been received and they are chosen simply because they appear to hold most of the species not known elsewhere. There are many other fine collecting areas which constantly give rise to good records but for which there is at present little evidence of lepidoptera not found elsewhere. Skipwith Common, Buttercrambe Wood, and the wooded valleys at Pickering (Gundale) and Scarborough (Forge Valley) are outstanding. Some of the steep sided valleys in the Wolds where *Melanargia galathea* (Marbled White) still thrives must certainly be preserved, but there seems no immediate threat and the butterfly moves about in search of suitable habitats. Austwick Moss, far from the popular collecting grounds, also looks worthy of attention but is not known to harbour anything special. Another locality which in Porritt's day would unquestionably have been included is Edlington Wood but there are few recent records indicating probably a dearth of collectors (particularly at night) rather than a dearth of insects. This wood lies near the southern end of the magnesian limestone belt on which lie a number of promising localities, all of which would repay further study.

Our records suggest therefore that we should try to preserve the six chosen localities but concentrate our studies on the rest of the County, hoping perhaps to show that the six selected sites are not as important as they at present appear.

9. SOME SPECIES TO LOOK FOR

Most of the additions that have been made to the County List have been accidental. This does not imply that they were not made by good field lepidopterists working systematically, but that they were not specifically looking for the species in question and were probably quite surprised to find it! No doubt we shall continue to have accidental discoveries but some species are not easily discovered by accident, they are shy and retiring by nature and do not venture far from their food-plant and unless looked for are likely to remain undetected. This final chapter therefore tries to point a way to the future, to indicate possible lines of exploration which seem to have at least a fair chance of success.

The thirty-six species listed below are either

- so far unrecorded in the County,
- already on our list but have not been seen recently and are perhaps no longer with us so that their rediscovery would be almost as significant as a new addition to the list, or
- recorded in such small numbers that it is not clear whether they are vagrants or undetected residents.

There are two other categories of possible addition which have not been individually listed:

- those that result from "splitting of species" of which several of those recently identified have not been established for Yorkshire e.g. *Oporinia christyi* (Pale November Moth).
- migrants of which there are several well known insects that are not yet on the list, e.g., *Lithosia quadra* (Large Footman) which reached Westmorland in 1970.

Erebia epiphron (Small Mountain Ringlet). (a). There have been rumours of this butterfly in the Pennines for many years but no authentic record.

Erebia aethiops (Scotch Argus). (b). Evidently no longer at Grassington but the two Westmorland colonies are not many miles from our border and some of the remote valleys in that area might be worth exploring.

Cerura bicuspis (Alder Kitten). (b). There are possible habitats between Sheffield and the Derbyshire border.

Notodonta anceps (Great Prominent). (b). May still survive in Buttercrambe Woods which is seldom worked with M.V. light.

Odontotia carmelita (Scarce Prominent). (c). The single specimen recorded in 1968 needs following up. The weather in early May does not often encourage night work so it may well be more plentiful than it seems.

Asphalia diluta (Lesser Lutestring). (b). Another good reason to work Buttercrambe Woods.

- Polyphoca ridens* (Frosted Green). (a). It is established in parts of the Midlands and should be looked for in large Oak woods in the south-west of the County, another moth which is out when the nights are still cold in Yorkshire.
- Drepana lacertinaria* (Scalloped Hook-tip). (b). Portable lights among the Birch in upper Grass Wood or that around Malham would surely confirm the status of this moth.
- Sarothripus revayana* (Large Marbled Tort). (c). Another moth to be sought in the larger Oak woods of the south-west.
- Euxoa cursoria* (Coast Dart). (b). It is quite possible that this will be found again on the sand-hills in the south-east.
- Amathes depuncta* (Plain Clay). (c). We need more records.
- Amathes stigmatica* (Square-spotted Clay). (c). This too should be sought in the valleys on the north of the Vale of Pickering.
- Apamea pabulatricula* (Union Rustic). (b). If this insect is not extinct in Britain it is as likely to be in south-west Yorkshire as anywhere.
- Dypterygia scabriuscula* (Bird's Wing). (a). It occurs in Cheshire and may well reach us one day.
- Aporophyla nigra* (Black Rustic). (c). It should perhaps be looked for in the north-west of the County.
- Coenobia rufa* (Small Rufous Wainscot). (c). A systematic attempt is needed to see where our solitary specimen could have come from; it occurs in Lincolnshire.
- Cosmia diffinis* (White-spotted Pinion). (c). This is a moth which may be more easily obtained as a larva by beating.
- Zenobia retusa* (Double Kidney). (b). Usually obtained as larvae under loose bark, the moth comes to light but does not fly far from its habitat among the willows.
- Schrankia taenialis* (White-line Snout). (b). This moth should be searched for after dark among heather growing in wooded areas.
- Tholomiges turfosalis* (Marsh Oblique-striped). (a). This inconspicuous little moth, perhaps better known as "The Tiny Snout" flies in the evening on mosses and might well be found in Yorkshire where there are several suitable habitats.
- Cosymbia porata* (False Mocha). (c). Another quarry to be sought in Buttercrambe and other large Oak woods.
- Cosymbia annulata* (Mocha). (b). If this does still occur it is most likely to be found by beating Maple where it grows along the margins of woods rather than in open hedgerows.
- Chesias rufata* (Broom-tip). (c). This moth is often found by beating for the larvae in Autumn in a well established patch of Broom even though its presence was previously unsuspected.
- Calocalpe cervinalis* (Scarce Tissue). (c). Our single record was from a garden not far from Valley Gardens in Harrogate where the food-plant is grown, it doesn't grow wild in the north so it is most likely that the moth will be associated with gardens.
- Calocalpe undulata* (Scallop Shell). (c). Bilberry growing in wooded areas is the usual habitat of this moth; our three records are widespread, it may still survive in at least one area.
- Chloroclysta siterata* (Red-green Carpet). (b). Another woodland insect which can be beaten out as the larva or taken in the Autumn at Ivy bloom or light; its continued existence needs confirmation.
- Thera variata* (Spruce Carpet). (a). This is now quite common in parts of Britain and with the extensive planting of Spruce it must surely appear in Yorkshire sooner or later.
- Thera cognata* (Chestnut-coloured Carpet). (a). It occurs in parts of Westmorland and if a suitable growth of wild Juniper can be found it may well be found to be resident.
- Hydrelia testaceata* (Waved Carpet). (b). An inconspicuous little moth which must be searched for in damp woods where there is plenty of Alder.
- Epirrhoe rivata* (Wood Carpet). (c). A single specimen taken at Spurn in 1970 revives hopes that this is still a Yorkshire resident.
- Eupithecia plumbeolata* (Lead-coloured Pug). (b). If the food-plant is still growing in quantity in woods near the original locality the moth may still be there too and is best found as a larva.
- Selenia tetralunaria* (Purple Thorn). (a). Although quite widely distributed in England, Wales and Scotland this attractive moth has yet to be taken in Yorkshire.

- Cephalis advenaria* (Little Thorn). (b). It was hoped that a recent Y.N.U. visit to Edlington Wood would lead to the rediscovery of this moth, it did not but the food-plant Dogwood is still abundant there and another attempt would be worth while.
- Cleora ribeata* (Satin Beauty). (a). This is another moth which is quite widely distributed among Spruce and should be worked for.
- Dipsosphesia scopigara* (Six-belted Clearwing). (b). This moth used to occur on the East Coast and it seems at least as likely that it has not been properly searched for as that it has become extinct.
- Aegeria myopaeformis* (Small Red-belted Clearwing). (b). The clearwings have not been properly worked in recent years and it is reasonable to suppose that this one still survives.

Another possible approach to the task of adding to the County list is the systematic working of particular food-plants for whole groups of species any one of which might be revealed. Reference to the Reed Beds has already been made in the previous chapter; another that comes to mind is Clematis. This grows mainly in the south of the County, often on the magnesian limestone. In the south of England it supports a range of quite common insects but we have only *Eupithecia haworthiata* (Haworth's Pug) and have no record of *Hemistola immaculata* (Small Emerald), *Melanthia procellata* (Pretty Chalk Carpet), *Horisme vitalbata* (Small Waved Umber) or *Horisme tersata* (Fern); is it too much to hope that one of these might be found? Another plant worth working would surely be Juniper if there is a good expanse of wild juniper in the north-west of the County; *Thera cognata* (Chestnut-coloured Carpet) certainly occurs in Westmorland only a few miles from our border, *Eupithecia helveticaria* (Edinburgh Pug) is unknown and *Thera juniperata* (Juniper Carpet) and *Eupithecia sobrinata* (Juniper Pug) seem only to be recorded where junipers grow in gardens.

10. CONCLUSION

It is clear that sixty years is too long an interval to allow between successive reviews of a county list, particularly in so large a county. A twenty-five year interval would be more realistic and a review would be comparatively easy to carry out if good records are kept throughout and the annual reports summarise all the significant records each year. So long has elapsed in this case however that a further review in ten years time is a desirable target if we are to have real confidence that we know just what insects we have and what we do not have in Yorkshire. If in 1980 we are to strike off as lost any species that has not been recorded since 1960 then we evidently have to work more systematically in the next ten years if the next review is not to show a further drop in the number of species in the County. Based on recent experience it should be possible to average one addition per year, at least half of which may be new while the rest are reconfirmation of species not seen since 1945. It will need a lot of hard field work to ensure that deletions do not more than offset these additions, and if this paper helps to guide our efforts in the right direction it will have served its purpose.

11. ACKNOWLEDGEMENTS

This paper has drawn freely from available literature in an attempt to relate the status of certain species in Yorkshire to that in neighbouring counties. Much of this information may however be out of date. I have therefore sought advice from Mr. J. Heath of The Nature Conservancy, from Mr. J. H. Johnson of the Derbyshire Entomological Society and from Mr. J. H. Duddington of Lincolnshire all of whom have given me information for which I am most grateful. I must also acknowledge the help and advice of four members of the Y.N.U. who read the manuscript and made many helpful comments: Dr. S. L. Sutton and Messrs. C. R. Haxby, S. M. Jackson and E. Richards.

12. POSTSCRIPT

This paper will appear during the second half of 1971. It is therefore necessary to state once more that it is a commentary on the original paper which was finished at the end of 1969. This paper does not attempt to bring the earlier paper up to date although in one or two cases comments do take into account events that occurred in 1970. A full analysis of the 1970 records certainly supports some of the ideas put forward and also provides one or two welcome surprises.

NOTES ON A COLLECTION OF SHORE FISHES FROM YORKSHIRE

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A small series of collections of fishes from shore pools on the Yorkshire coast was made in August 1970. These collections were made as part of a continuing survey of the distribution of littoral species around the British Isles, which will be published elsewhere. However, the 1970 collection contained some interesting fishes, and one notable record of occurrence, and for this reason a separate note on them seems to be called for.

The method employed to catch the fish has been described elsewhere (Wheeler, 1970) but may be summarized here. Suitable pools at varying levels on the shore are treated with fish-specific anaesthetic, so that the fishes can be caught while quiescent and released after identification and measurement into clean water to recover. Specially interesting fish, or specimens too small to identify in the field, were retained and are now in the collection of the British Museum (Natural History). This method permits a high proportion if not all of the total fish population of any pool to be captured.

Three sites were visited along the Yorkshire coast, Robin Hood's Bay (two pools 7.8.1-2); Burniston, to the north of Scarborough (one pool 4.8.1, four pools 5.8.1-4), Flamborough Head, South Landing (two pools — neither containing fish).

LIST OF FISHES CAUGHT

The species are listed in systematic order, the number of specimens caught and their length range at each pool are given. Lengths are standard length and are given in millimetres. Nomenclature follows Wheeler (1969).

ANACANTHINI — GADIDAE

Gaidropsarus mediterraneus (L., 1758) Shore rockling

Burniston, pool 5.8 (=5 August) 1, one (195 mm.).

Ciliata septentrionalis (Collett, 1875) Northern rockling

Burniston, pool 5.8.2, one (65 mm.).

Ciliata mustela (L., 1758) Five-bearded rockling

Burniston, pool 4.8.1. four (86-145 mm.); pool 5.8.1., six (94-158 mm.); pool 5.8.2., eight (two 31-32, six 96-111 mm.); pool 5.8.4., three (30, 101-117 mm.).

Robin Hood's Bay, pool 7.8.1., five (91-118 mm.); pool 7.8.2., two (81-88 mm.).

PERCOMORPHI — BLENNIIDAE

Blennius (Lipophrys) pholis L., 1758 Shanny

Burniston, pool 4.8.1., two (42-67 mm.).

PHOLIDIDAE

Pholis gunnellus (L., 1758) Butterfish

Burniston, pool 4.8.1., five (41, 71-81, 141-151 mm.); pool 5.8.1., thirty-six (eighteen 29-65, seven 85-110, eleven 113-146 mm.); pool 5.8.2., nineteen (six 31-40, two 69-76, eleven 102-167 mm.); pool 5.8.3., three (56, 102, 123 mm.); pool 5.8.4., ten (four 41-45, two 73-86, four 102, 131-157 mm.).

Robin Hood's Bay, pool 7.8.1., fifteen (five 31-46, four 96-113, six 121-170 mm.).

ZOARCIDAE

Zoarces viviparus (L., 1758) Eelpout

Burniston, pool 5.8.1., four (81, 86, 188, 199 mm.).

Robin Hood's Bay, pool 7.8.2 (95 mm.).

SCLEROPAREI — COTTIDAE

Taurulus bubalis (Euphrasen, 1786) Sea scorpion

Burniston, pool 4.8.1., six (63-103 mm.); pool 5.8.1., thirty-nine (one 18, sixteen 52-76, nineteen 80-115, three 130-150 mm.); pool 5.8.2., one (63 mm.); pool 5.8.3., three (70, 120, 120 mm.); pool 5.8.4., six (three 19-30, three 82, 114, 124 mm.).

Robin Hood's Bay, pool 7.8.1., one (27 mm.).

LIPARIDAE

Liparis montagui (Donovan, 1805) Montagu's sea snail

Burniston, pool 5.8.1., one (10 mm.).

DISCUSSION

The marine fishes of the Yorkshire coast have been very well studied by comparison with most parts of the English coast, notably due to the careful recording of W. J. Clarke, and more recently by D. E. Whittaker. These recorders have, however, concentrated more on the less common offshore species than those actually found littorally. A notable account of Yorkshire marine fishes by Clarke (1944), which was closely followed by

Spaul (1956) in his essay on the fishes of Scarborough, summarised Clarke's records and earlier notes. The present paper adds something to these and later accounts chiefly because it deals with the previously rather neglected littoral fish fauna. But it is far from complete and there is little doubt that a more intensive survey employing the same methods over a longer period of time would result in a considerable addition to knowledge in this area.

Two of the fish recorded here have not been reported from the Yorkshire coast before. The reason for this is not primarily due to their rarity but because they have in the past been confused with other, more common species.

Gaidropsarus mediterraneus, the shore rockling, has for long been confused with the larger offshore species of three-bearded rockling, *G. vulgaris*. The former, which is the smaller species, attaining a maximum of 25 cm. (10 in.), was formerly thought to be the young of *G. vulgaris* which attains 53 cm. (21 in.). The distinguishing characters of the two species have been discussed elsewhere (Wheeler, 1969). A distinction which appears to be constant and which serves as a useful field character, is that *G. mediterraneus* is uniformly dark in colour and is found on the shore between tidemarks and sublittorally, while *G. vulgaris* is pinkish with dark brown bars on the back and appears to live sublittorally. Both species have three barbels on the head, one on the chin, one on each nostril. Because of the confusion which has existed between these species it is not possible to determine to which earlier records apply. Clarke (1944: 101) refers to *Motella tricirrata*, saying it is "not common odd specimens are captured occasionally both in deep and shallow water . . . six examples in the Scarborough district since 1913, and one at Filey", which suggests that the specimens he had seen were *Gaidropsarus vulgaris*. It appears therefore that the shore rockling, *G. mediterraneus*, has not previously been identified on the Yorkshire coast. This species is extremely rare on the North Sea coast of the British Isles and I could find no acceptable accounts of its occurrence in an earlier study (Wheeler, 1969).

Ciliata septentrionalis, the northern rockling, was not recognised in British waters until 1960 (Clyde Sea area). Since then, however, I have reported it from a number of other localities off the British Isles, from the western English Channel to the Moray Firth (Wheeler, 1965) and off south-west Ireland (Wheeler, 1968). It has been recorded by Fonds (1964) from offshore on the Dutch coast. All these records have been of fish caught in between 9 and 90 m. of water and it has never before been taken littorally, as at Burniston. Only further collecting in the area and careful examination of any five-bearded rocklings caught, can determine whether it normally occurs between tide-marks on the north-east coast, or whether this occurrence was the exceptional capture of a vagrant specimen. The northern rockling is known to occur off the Yorkshire coast, for Mr. D. E. Whittaker has shown me specimens obtained offshore in March and April 1970.

The relative poverty of the littoral fish fauna on the north-east coast of England is shown on this collection. Only eight species occur in it and three of these are represented by single specimens only. By comparison a collection made in Guernsey, C.I., in August 1969, using the same methods but a rather greater collecting effort, produced thirteen species, only three of which occurred as single specimens. The most abundant shore fishes in the Yorkshire collection were the five-bearded rockling, the butterfish, and the sea scorpion which occurred in pools at all levels on the shore. There appears to be a correlation between the abundance of the sea scorpion and the quantity of submerged fucoid algae in the pools, and fewest were found in those pools which lacked this feature. Possibly this can be associated with the body shape of the sea scorpion, a heavy-bodied, broad-headed fish, which cannot utilise many of the crevices in the rock, or burrow under loose boulders in the manner of the five-bearded rockling or the butterfish.

The only specimens of the shanny *Blennius* (*Lipophrys*) *pholis* taken were caught at around high water neap tide level, even though similar pools at this level were also treated. This apparent sparsity is interesting in view of Clarke's (1944) comment that this species is "a very common resident in the rock-pools". The four specimens of eelpout, or viviparous blenny *Zoarces viviparus* taken in a low tidal pool (between LWS and LWN) are in keeping with the generally sublittoral distribution of this species along the east coast. From collections made since 1955 it can be suggested that this fish is common sublittorally in the Thames estuary (unpublished data) and northwards, that it is rarely found between tide-marks (i.e. the littoral zone) south of Norfolk, but to the north becomes more common as a littoral species, and is found higher up the

shore the further north one goes. The single specimen in a pool near high water neaps (7.8.2) at Robin Hood's Bay seems to conform to this general rule. It is of some interest that neither Clarke, nor Spaul appear to have recorded this species except in "inshore waters", which suggests that they did not know of records on the shore.

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A REVIEW OF YORKSHIRE PSEUDOSCORPIONS

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William Falconer's (1862-1943) important contribution to arachnid systematics, "Key to the Families and Genera of British Spiders and to the Families, Genera, and Species of British Harvestmen and Pseudoscorpions" (Falconer 1910), stimulated and made practicable the scientific study of arachnida in Yorkshire, a study first pioneered in the 1670's by Martin Lister, father of arachnology. Falconer's extensive work, based partly on Rev. O. Pickard Cambridge's paper "On the British Species of False Scorpions" (1892), made available an up-to-date and accessible key for amateur naturalists, "who", wrote Falconer, "had hitherto been beset by the lack of accessible and comprehensive literature on the subject".

Although pseudoscorpions have probably received more attention and are better recorded in Yorkshire than in most counties, they have never been intensively worked and still remain a very neglected and little known group. In 1909 the Arachnida Committee of the Yorkshire Naturalists' Union was established under the chairmanship of William Falconer and an era of active collecting and recording commenced. With the help of such eminent naturalists as H. Britten, T. Stainforth, G. B. Walsh and W. P. Winter, data on most of the British groups of arachnida accumulated, to be compounded with earlier work by the indefatigable Falconer, to form a series of excellent and useful reviews. First to appear was "The Harvestmen and Pseudoscorpions of Yorkshire", published in 1916, which even today remains the standard and only detailed work on the distribution and ecology of these orders in Yorkshire.

Today, twelve of the twenty-six species known to occur in the British Isles are recorded for Yorkshire. H. Wallis Kew, in his paper "North of England Pseudoscorpions" (Kew 1903), listed only four species for Yorkshire — *Chthonius ischnocheles* (Herm.), *Neobisium muscorum* (Leach), *Dactylochelifer latreillei* (Leach) and *Lamprochernes nodosus* (Schränk) — and made a plea for naturalists to take more note of this fascinating and compact little group.

Falconer (1916) included a further four species for Yorkshire — *Chthonius tetrachelatus* (Preyss), *Cheiridium museorum* (Leach), *Allochernes dubius* (O. P.-C.) and *Toxochernes panzeri* (C. L. Koch) — and expressed the belief that it was improbable that any more species would be added. Subsequently four additional species have come to light, *Pselaphochernes scorpioides* (Hermann), *Chthonius orthodactylus* (Leach), *Chernes cimicoides* (Fab.) and *Lamprochernes godfreyi* (Kew).

Today our knowledge of pseudoscorpions is still very superficial. With so little attention being paid to these captivating creatures, there is a great deal of scope for original work, even of a most elementary nature, on their distribution, ecology and life histories. The excellent papers by P. E. Jones (1970) on *Chthonius ischnocheles* and *Lamprochernes nodosus* are model studies which naturalists could usefully extend. The field is wide open and every record is valuable.

The following list indicates the records in Falconer's 1916 review, brings together all subsequent records and information, and attempts to give some idea of the frequency,

distribution and general habitat requirements of the currently-known Yorkshire pseudoscorpions. The arrangement and nomenclature follows that used by Beier (1932) and adopted by Evans and Browning (1954).

Order PSEUDOSCORPIONES Pavesi.

Suborder CHTHONIINEA Beier.

Family Chthoniidae Hansen.

Chthonius tetrachelatus (Preyss), (*Ephippiochthonius tetrachelatus* (Preyss))

A widely distributed species in Britain and Ireland, though apparently more abundant near the sea. Occurs in woods, outhouses, greenhouses, old gardens etc. in moss, under stones, amongst leaf litter and rotting vegetable matter.

Recorded from V.C. 61 and 63 (Falconer 1916) and subsequently V.C. 62.

(61) Spurn Peninsula 26-28/5/1928 (*Nat.* 1928, 276).

(62) Though no specific records are cited, it is recorded as "common near the sea" in *Nat. Hist. Scar. Dist.* 2, 331.

(63) Sheffield 1922 (*Nat.* 1923, 24).

C. ischonochelus (Hermann), (= *C. rayi* L. Koch).

An abundant and widely distributed species in Britain, occurring in a variety of situations, e.g. woods, quarries, cellars and outhouses where it can be found under stones, amongst leaf litter and decaying vegetable matter.

Recorded from V.C. 61, 64 and 65 (Falconer 1916) and subsequently V.C. 62.

(61) Spurn and Easington 25-26/5/1928 (*Nat.* 1928, 276).

(62) Spaunton Moor, August 1958 (Cloudsley-Thompson 1960). Recorded as common in the Scarborough district, though no specific records are cited (*Nat. Hist. Scar. Dist.* 2, 331).

(65) Grinton, near Reeth -/5/1920 (*Nat.* 1920, 255).

C. orthodactylus (Leach).

Considered by Evans and Browning (1954) to be a southern species occurring under stones and among decaying vegetation.

(61) The only record for Yorkshire is from Spurn Peninsula in June, 1950, where it was noted as being uncommon (*Nat.* 1953, 171). On shingle and dune, amongst seaweed and tidal debris, under stones and amongst the roots of Marram grass.

Suborder NEOBISIINEA Beier

Family Neobisiidae Chamberlin

Neobisium muscorum (Leach) (= *Obisium muscorum* Leach).

Probably the most abundant, widely distributed and well known British pseudoscorpion. It is commonly found in leaf litter, rotting vegetation, moss, and under stones, and has been recorded many times from all the Yorkshire vice-counties.

(61) Allerthorpe Common -/11/1938 (*Nat.* 1938, 335).

(62) Skelder 22/2/1937 (*Nat.* 1937, 278), Whitby 2/1/1938, Mulgrave Woods 29/1/1938, Goathland 5/3/1938 (*Nat.* 1938, 335), Scarborough District 1966, per D. Whittaker.

(63) Bingley, Marden Valley 13/5/1922 (*Nat.* 1922, 231), Denshaw, commonly per P. Skidmore, Sheffield Museum garden 26/5/1964, and 21/5/1969, Blackmoor 26/5/1964, per Sheffield Museum. Thorne Moors, commonly in Sphagnum. Sandall Beat Wood N.R. common in leaf litter; C.A.H.

(64) Austwick, winter 1920 (*Nat.* 1921, 167). Fountains Fell (2150 ft.) 22/5/1964, Tarn Moss (1200 ft.) 25/9/1961 and 20/6/1964, per P. Jones.

(65) Mill Gill and Witfield Forces, 7-9/6/1919 (*Nat.* 1919, 306), Reeth area -/5/1920 (*Nat.* 1920, 255).

Suborder CHELIFERINEA Beier

Family Cheiridiidae Chamberlin

Cheiridium museorum (Leach)

The smallest of the British pseudoscorpions measuring from 1-1.5 mm. in length. It is a widely distributed species occurring in a variety of situations, e.g. under loose bark, in birds nests, bat roosts, barns, haylofts, stables and old derelict dwellings and warehouses. Recorded from V.C. 61 and 63 (Falconer 1916); there have been no subsequent Yorkshire records.

Family Cheliferidae Hagen

Dactylochelifer latreillei (Leach), (= *Chelifer degeerii* Koch)

A maritime species favouring sand dunes along the east coast of England and Scotland where it is generally collected from beneath drift wood. Falconer describes it also occurring in the sheathing at the bases of marram grass stems. Recorded from V.C. 61 (Falconer 1916) and subsequently V.C. 62.

- (61) Spurn peninsula, many records noted as common, collected from Kilnsey Warren, Humber Foreshore, Walker Butt Dyke, and Marsh meadows, June-August 1947-1950 (*Nat.* 1953, 171).
- (62) Flixton (*Nat. Hist. Scar. Dist.* 2, 331).
Family Chernetidae Menge
Lamprochernes godfreyi (Kew) (= *Chelifer Chernes godfreyi* Kew).
An infrequently recorded species occurring in manure and compost heaps. As with *L. nodosus* they attach themselves to the legs of flies, probably as a means of dispersal from breeding sites which may be of a potentially temporary nature.
- (63) The first Yorkshire record was from Leeds in 1912 where a specimen had been taken from a decaying *Begonia* tuber sent from Cardiff (*Nat.* 1922, 44). One taken from the leg of a stable fly *Stomoxys calcitrans* (L.) in Bessacarr, Doncaster, 1/9/1970; C.A.H.
- Lamprochernes nodosus* (Schrank) (= *Chelifer nodosus* Schrank).
A common and widely distributed species occurring in relatively temporary situations like manure and compost heaps, piles of grass cuttings and various types of leaf litter. Jones (1970) describes in detail the frequently observed habit of *L. nodosus* of clinging to the legs of flies as a means of phoresy. "The various stages with life-cycle of the pseudoscorpion *L. nodosus* and the fly *Musca domestica* occur at the same time. It would seem that, since *M. domestica* moves from one manure heap to another and, being an excellent means of transportation, *Lamprochernes* has adapted to utilise this method of dispersal."
It has been recorded several times for Yorkshire, sometimes in large numbers. Noted for V.C. 61, 62 and 63. (Falconer 1916).
- (61) Bridlington 9/10/1925 on housefly leg; Brit. Mus. Coll.
- (62) Falsgrave, Scarborough, 8-9 taken from the legs of a fly, 1913 (*Nat.* 1918, 43). Saltergate, among refuse in a cattle shed 10/4/1937 (*Nat.* 1937, 278). Whitby 7/10/1937 (*Nat.* 1938, 335). Ellerburn Bank N.R., June 1968, attached to the leg of a fly; Dr. M. B. Usher. Well, Bedale 25/10/1968, one specimen from oats and barley residues infested with a variety of beetles and mites (*Min. of Ag. Fish & Food*).
- (63) Huddersfield 1919 and 1920 on the legs of flies (*Nat.* 1921, 43).
Pselaphochernes scorpioides (Hermann), (= *Chernes minutus* Ellingsen)
Stated by Evans and Browning (1954) to be a southern species, occurring in vegetable refuse and in rubbish heaps etc.
- (62) The only Yorkshire record is of one taken from a nest of the ant *Formica rufa* L. at Barnes Cliff, Harwood Dale 1924 (*Nat.* 1924, 140).
Chernes cimicoides (Fabricius) (= *Chelifer geoffroyi* Leach).
Abundant in south-east England under the bark of dead and decaying trees. Evidence of its occurrence north of the Humber has only recently come to light. The first Yorkshire-taken specimen is one collected by the late Arthur Smith, probably in the 1950's, in the York area. The specimen came into the possession of Mr. D. Whittaker who brought it to the attention of the author for whom it was determined by Dr. P. Gabbutt.
- (64) Subsequent localised records are of a male and female taken from under the bark of a dead birch tree at Askham Bog 2/9/1965; Dr. P. Gabbutt.
- Allochernes dubius* (O.P.C.) (= *A. tullgreni* Strand)
Occurs under embedded rocks, amongst loose stones and amongst vegetable debris. It has also been found attached to legs of harvest spiders. Recorded from V.C. 61, 63 and 64 (Falconer 1916), and subsequently from V.C. 62.
- (62) Hayburn Wyke -/8/1919 (*Nat.* 1920, 43).
- (64) Leeds, under birch tree roots in Roundhay Park 1921 (*Nat.* 1922, 43-44).
Toxochernes panzeri (C. L. Koch).
Occurs in many widely separated localities and situations; usually found among hay and other similar refuse in barns, stables, granaries, old buildings and birds nests, it has also been found beneath embedded rocks and flagstones.
Recorded from V.C. 63 (Falconer 1916), there have been no subsequent records.
- I would like to thank Dr. Peter Gabbutt of the Department of Zoology, University of Manchester, for the determination of specimens, information on *Chernes cimicoides*, and for advice on nomenclature and systematics; Mr. Tim Riley, Keeper of Natural History at Sheffield City Museum, for data on pseudoscorpions in the natural history collections at Sheffield Museum; Mr. Phillip Jones for information on Yorkshire-taken specimens in collections outside the county; and Mr. Peter Skidmore for advice on the preparation of this paper.

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CORRESPONDENCE

Dear Sir,

On the morning of 9th May, a lady in the village called me to the telephone. She was in some distress. The previous evening she had found two eggs on her lawn, and had put them with her kindling on the Aga stove. To her consternation she found that one of the eggs had hatched out during the night: What could she do? She was due to leave in the morning at 6.30 for a week's holiday in Torquay.

In reply to my questions she said that the eggs were alike, bluish in colour, and rather smaller than a blackbird's. I suggested that they were probably starling eggs, as this bird is notoriously careless in the disposal of its offspring, but I could think of no way out of her dilemma. And then I had an idea. "Have you", I asked, "any nests in your garden with eggs or young birds?" Yes, there was a blackbird's nest with four eggs in the base of an old straggly *Senecio* bush. "Well!" I said, "put the tiny bird and the other egg in the nest and hope for the best."

This she succeeded in doing and departed the following morning much relieved in mind. On her return, a week later, one of her first duties was to visit the nest; and there, to her delight, she found an obviously well-fed young bird, which was being assiduously fed by the two foster parents.

My first chance to inspect the nest was on 21st May. With great care and some difficulty, I extracted the nestling. Judge of my amazement on recognizing it as a young cuckoo! The second egg and two of the blackbird's had been thrown out of the nest, and the other two were embedded in the base, and obviously past hope.

On my next visit on 28th May, I learned that the young bird had left the nest, but was still being fed by the two blackbirds. It was last seen on 18th June, quite well grown, but apparently without any tail feathers.

I can find no record of a cuckoo being reared by blackbirds, but apart from this the incident poses a number of problems. Why two eggs at different stages of incubation? Why should the blackbirds accept the young bird? Is there any record of a wild bird's egg hatching out on an Aga stove?

Perhaps some of your readers could suggest answers to these and other points.

R. S. POLLARD

Cloughton, Nr. Scarborough

THE INSECT FAUNA OF A BOG OAK FOUND NEAR ASKERN

P. SKIDMORE

Whilst excavating a channel for a drain in one of his fields, Mr. G. D. Watkinson of Norton Common Farm near Asker, dug out a bog oak measuring about ten feet long by two feet thick. His son found a mammalian bone and a fragment of Horsetail (*Equisetum*) amongst the ejected material beside the channel and a day or two later on 28th July 1970, Mr. Watkinson brought these into the Doncaster Museum for examination.

On 30th July a visit to the site was undertaken by Messrs. T. G. Manby, P. C. Buckland and the writer, when an examination of the bog oak was made.

The tree had lain immediately below the lower horizon of the peat deposits on laminated clays from which Mr. Buckland deduced that it may have been late Bronze Age in date. The main plant remains lying in the precise level near where the log had lain were *Quercus* (branches and acorns), *Corlyus* (nuts) and *Betula* (twigs and branches). One of the acorns found by Mr. Manby had a neat round hole indicative of the attentions of a *Balaninus* (Coleoptera: Curculionidae) species.

When an examination was made of the log it was seen to have been ravaged by a fungus for there was a heart rot of the type caused by the fungus *Polyporus sulphureus*. Near the distal end was a small rot hole the mouth of which was about one foot wide. Debris from this rot hole was removed and placed in a plastic bag for inspection at the Museum.

The present paper is by way of a report on the contents of this rot hole.

PLANT REMAINS

In the absence of facilities for pollen analysis, only macroscopic material could be determined.

Quercus sp. (Oak). Many leaves, leaf bud scales and one acorn.

Betula sp. (Birch). Leaf fragments lying between Oak leaves.

ANIMAL REMAINS

Only invertebrate remains were found though one of these (*Trox scaber*) suggested that at some time or another a bird's nest was situated near the rot hole (Bird of prey or Jackdaw).

The following list includes all those species determinable by fragments in the rot hole. A few undetermined pieces remain.

The material found indicates:

1. The climate was warmer when the tree was standing than it is now (i.e. presence of *Gnorimus nobilis*).
2. The tree stood in the old established, probably virgin, forest land of oaks with very rich insect fauna (i.e. wide range of species present in small rot hole), including old forest indicators like *Calosoma* and *Thymalus*.

COLEOPTERA

Calosoma inquisitor (L.). Left mandible; left elytron and apex of right elytron; four tibiae, including front pair; four femoral fragments, one almost complete. An arboreal Carabid of old oak forest areas.

Bembidion sp. (? *nitidulum* Marsham). Three head capsules; one prothorax.

B. sp. indet. Head capsule; near to *tetracolum* Say.

Bembidion species are most numerous in marshy places.

Pterostichus strenuus (Panzer). Ten head capsules; five prothoraces; many elytra.

Common species, usually in damp places.

Oxytelus sp. (prob. *rugosus* F.). Six head capsules, three prothoraces. Very common in decaying animal and vegetable matter.

Stilicus sp. (prob. *rufipes* (Germ.)). One head capsule only. Fairly common in decaying animal and vegetable matter.

Lathrobium sp. Two head capsules and one right elytron. The elytron was unicolorous reddish but lacked the hind marginal carina of *fulvipenne* Grav. Common in marshy situations.

Cryptobium fracticorne (Pk.). One head capsule. Characteristic beetle of *Sphagnum* bogs.

Quedius sp. One head capsule with mandible attached. Also two abdominal tergites. Compared with *Q. ventralis* Arag., and *lateralis* Grav., but agreed with neither exactly.

Melanotus rufipes (Hbst.). Prothorax, both elytra and basal half of abdomen. Common species in decaying trees.

Thymalus limbatus (F.). One right elytron complete and in perfect condition: broadly reddish lateral margins perhaps suggested teneral specimen. Very local species associated with Polypores on trees growing in old forest areas (oak, beech, pine).

"Clavicorn sp. indet.". Two head capsules slightly resembling *Typhaea stercorea* L. but not that species.

Trox sp. (? *scaber* L.). One almost complete left elytron. This keys out to *scaber* but is slightly aberrant. Breeds in birds' nest in old hollow trees.

Gnorimus nobilis (L.). Pygidium, attached abdominal tergites, and various pleural fragments. Very rare species restricted now in Britain to Southern England — coinciding with 62°F July Mean Isotherm. Only known to breed in rot holes in old apple trees.

Rhagium bifasciatum F. One left elytron only. Common species breeding in decaying trees of many species but not normally in oak.

Ceuthorrhynchus sp. Thirteen head capsules, six thoracic fragments, thirteen elytra and many legs. Rather similar to *Cidnorrhinus 4 maculatus* (L.) but not that species.

UNIDENTIFIED COLEOPTERA REMAINS

One large right mandible. Two elytra with very deeply punctured striae.

HYMENOPTERA

Remains of this order consist of four different head capsules: they appear to be parasitic species (i.e. Braconids, Ichneumonids etc.)

DIPTERA

Fragments of puparia of six species: one is certainly a Tachinid, another probably a Clusiid, another most probably an Anthomyid.

HEMIPTERA

Dryinus sp. One head capsule; perhaps *brunneus* Sahlberg.

Anthocoris sp. One head capsule only.

ARACHNIDA

? *Ciniflo* sp. Front part of cephalothorax bearing simple eyes.

CHILOPODA

Lithobius sp. (prob. *forficatus* L.). Many tergal and leg fragments.

ANNELIDA

Lumbricus sp. Numerous egg capsules — mostly unhatched.

COMMENTS

The most notable discovery was *Gnorimus nobilis* for this today is a very rare southern species in England. There are no records of this species occurring in Yorkshire although it was stated to have been taken in Cumberland last century. It is also most unusual to find this species in oak as it is usually associated with rot holes in old apple trees.

Thymalus limbatus and *Calosoma inquisitor* are typical insects of old forest areas and as such are very local in Britain today. Their occurrence in the Askern area in Bronze Age times would have been expected.

The other species are all common in Britain today. *Pterostichus strenuus* and the *Bembidion* species would suggest a damp situation, *Cryptobium fracticorne* would suggest mire conditions with *Sphagnum* dominating. The large size of the *Lithobius* remains suggested that they were most probably *forficatus*.

During February 1971 a cursory examination was made of bog timber which was unearthed during excavation of very deep land drains adjacent to Epworth Turbary. These penetrated below the lower horizon of the surface peat layer, and bog timber thrown up from the lowest level was searched for Coleoptera remains. A log which had been heavily attacked by a longhorn beetle was dissected with the eventual reward of a larval head capsule of the culprit. It proved to be of *Strangalia maculata* Poda! In rotten material in a hollow log an elytron of the Chrysomelid *Chrysomela graminis* L. was found. In this horizon the main trees were *Quercus*, *Betula*, *Corylus*, *Alnus*, *Salix* and *Taxus*.

LICHENS OF THE MIDDLE TORNE VALLEY

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On 14th June 1970 the members of the Doncaster Museum and Art Gallery visited the valley of the River Torne, an area in the extreme south of Hatfield Chase and on the Yorkshire-Lincolnshire border. To a lichenologist, the initial impression is one of gloom due to the apparent absence of habitats available for lichen colonisation in a predominantly agricultural landscape with only hedge and ditch field boundaries. However, a closer study of calcareous and siliceous stonework of bridges, gateposts and fences proved that the visit was not to be without reward. In all thirteen new vice-county records were made, twelve of which were new to V.C. 63 and one new to V.C. 54.

In the following account taxa marked with an asterisk have not been previously reported in the literature as occurring in the particular vice-county.

The calcareous stonework of Torne Bridge (V.C. 63: SE 677034) yielded *Lecanora dispersa*, *Candelariella aurella*, *C. vitellina*, *Caloplaca citrina*, *Lecania erysibe* and its form **sorediata* Laund., **Rinodina subexigua*, *Lecanora muralis*, *Verrucaria muralis*, *V. nigrescens*, **Lepraria incana*, *Physcia grisea*, *P. orbicularis*, and **P. nigricans*. The latter species was until recently regarded as a corticolous species and very rare, although it now appears to be quite widespread, at least in eastern Britain. It is usually found on concrete, mortar and asbestos growing often as small patches amongst *Physcia orbicularis*.

A stone gatepost lying nearby in a field added the following species: *Lecanora campestris*, *Caloplaca holocarpa*, *C. murorum*, **Catillaria chalybeia*, **Lecidea scabra* and **L. stigmatea*. Although *L. stigmatea* is reported here as new to V.C. 63 the older records of *L. goniophila* (Watson, 1953) are probably referable to this species.

On a burnt oak log in the same field was the most interesting find of the day, namely, **Thelocarpon laureri* which was growing with **Catillaria denigrata*, *Lecidea uliginosa* and **Cladonia coniocraea*. *T. laureri* is a rather pleasing sight under the hand lens, consisting of minute citrine dots each containing a single ascocarp. Very few British localities are known for this species, perhaps due to its small size, and no previous records have been reported from Yorkshire.

From Torne Bridge the party moved on to Candy Farm which lies on the county boundary (SE 698030). On the concrete stonework of a bridge on the Lincolnshire side (V.C. 54) the lichens were more conspicuously developed than at Torne and formed a community dominated by foliose species belonging to the union *Physcietum caesia* (see Laundon, 1967) of the Xanthorion. The component species were *Physcia caesia*, *P. orbicularis*, *P. nigricans*, *P. adscendens*, *Lecanora muralis*, *L. dispersa*, *Xanthoria parietina*, *X. aureola*, *Caloplaca citrina*, *Candelariella aurella*, **Lecania erysibe* and *Rinodina subexigua*. The community at Torne differed mainly in that the foliose and squamulose species were of only minor importance indicating relationships to the federation *Lecanorion dispersae* (Laundon, 1967).

Two other species, *Verrucaria muralis* and *V. nigrescens*, were also seen at Candy Farm on mortar.

An examination of oak, birch and alder trees on the Yorkshire side near the southern end of Hatfield Moor showed them to be covered in the *Conizaeoidion* community which consists only of the ubiquitous *Lecanora conizaeoides* accompanied by the alga *Pleurococcus viridis* (Agardh) Rabenh. (Laundon, 1967). No additional lichen epiphytes were found although *Cladonia fimbriata* and **Lepraria incana* were seen on rotting stumps. This sad state of affairs regarding the epiphytes markedly reflects the afflictions brought about by air pollution from urban areas and industrial sites upon the lichen flora of this region.

One final locality visited, the sandstone parapet of a bridge over the North Idle Drain (V.C. 63: SE 738056), yielded *Lecanora polytropa*, *Lecidea tunida* and **L. fuscoatra* var. *grisella*.

My thanks are due to the leader of the excursion Mr. W. Bunting for a general introduction to the area.

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BOOK REVIEWS

Highland Birds by D. Nethersole-Thompson. Pp. 112 with 51 colour and 20 black and white photographs. Published by the Highlands and Islands Development Board, 1971. £1.25.

The preface describes this first book in a projected series on the Highlands, as an "intimate personal sketch". Whilst much of the writing has a lyric quality about it, at other times the intimate personal style is somewhat overdone and then becomes destructive. Blackie and Baldy, for instance, will be meaningless to those who haven't read the author's monographs on the Greenshank, the Dotterel and the Snow Bunting. Whilst to bird-watcher pilgrims to Speyside the Nethersole-Thompsons are a legend, new readers may be forgiven for being puzzled by references to Brock. And I must confess a personal distaste for the use of familiar names such as Goldie for Golden Plover (or Goldfinch or Goldcrest).

But these are carping criticism few and far between when considered against the general tenor of the writing — vivid, imaginative, exuding enthusiasm and, what I liked best, challenging. Ten questions are posed about the woodcock. There are equally searching ones on ravens and other species. Why not do this, why not study that, we are continuously being asked. Behind it all there is the alert, enquiring mind. "Orkney needs a field station and a long-term research programme." "We probably know more about dotterels and golden eagles than about the homely but secretive hedge-sparrow."

The book deals with the birds of the various regions of the mainland and the western and northern isles in eight separate sections, each headed with an outline map. It is lavishly illustrated and attractively produced, with generous spacing and gracious format. It will be nostalgic to many, and inviting to many, many more. R.F.D.

Your Book of Photographing Wild Life by John Marchington. Pp. 56 with 30 photographs. Faber & Faber Ltd. 90p.

While primarily written for young people this slim volume contains useful advice for the beginner at nature photography, whatever his or her age may be. Although hides are mentioned the book does not deal with photography from them, but concentrates on the use of the single lens reflex, with long focus lens, as a means of obtaining photographs by stalking or from a car window.

In simple easily understood English the author gives sound guidance on photographic equipment, materials and techniques in addition to describing how the illustrations in the book were obtained. Some of the latter are very good, but many suffer from the subject being incomplete and too large for the frame. These portraits would have been greatly improved with a little more surrounding; after all there is not much point in photographing a creature in the wild and then failing to show all of it as well as some of its habitat.

There may be some who will question the "wildness" of fallow deer and many of the bird photographs could well have been taken in a London park, but I think the author did right to include such subjects; they are ideal material upon which the beginner can try his prentice hand. A.G.

Butterflies of Trinidad and Tobago by Malcolm Barcant. Pp. 314 with 28 plates mainly in colour. Collins. £2.75.

At first glance this is another of Collins' admirable Field Guides but closer inspection shows that although it has many of the characteristics of that series this book is rather different; it is as the author says primarily directed at the layman and the amateur.

Trinidad and Tobago cover less than 2,000 square miles — an area much smaller than the county of Yorkshire — yet they boast a population of 617 species of butterflies which may explain why these islands are becoming a more popular collecting ground for holidaying lepidopterists.

The list includes 230 species of "skippers" and these receive only a mention but the book should prove adequate for the identification of the remaining 387 species, most of which are illustrated. A strange feature is that the species are arranged not in taxonomic order but partly by habits and habitats and partly by degree of rarity. This means that related species do not always occur in the same part of the book.

The author has lived and collected in Trinidad for nearly 50 years and writes as much to encourage the study of butterflies by the local residents as to enable the serious collector to identify his specimens. He gives a useful guide to the better collecting areas in the island and a general introduction to the study of butterflies. C.I.R.

Lives of British Lizards by Colin Simms. Pp. 128 with 4 colour plates and 18 text figures. Goose & Son, Norwich, £2.75.

This book will be read and enjoyed by field naturalists and others and the little snatches of appropriate bygone verse and prose add to its interest. Following the introduction are chapters written in a very easy and attractive style featuring the recognition of a lizard, its kinds of habitat and its general cycle of living throughout the year.

The latter half of the book essentially records the author's own detailed and specific study of most aspects of the lacertid life and upon this he is to be congratulated for the success he obviously deserved and for the wealth of information to which reference will be made for many years to come. He takes his readers with him on his very many hours of patient watching — this knowledge could have been obtained in no other way. The everyday journeys, the social events and encounters and behaviour, food, home and family life of these shy reptiles are all there for us to share. Which leaves us rather sad when we realise that the Lancashire "aristocrat" — the Sand Lizard — has had to give way to the endless building of housing estates. The Slow-worm also has its allotted chapter.

One hopes the price of the book may not prove a deterrent.

E.H.

A Handbook of Water Plants by Eva M. Bursche. Pp. 128 with 92 drawings. Frederick Warne. 65p.

First impressions predisposed me in favour of this book on account of the excellent drawings. They capture the individuality of the species portrayed and combine realism with elegance. About 100 species are illustrated and briefly described and keys are provided for their identification, the arrangement being into three habit groups — emergent, floating and submerged. In a book of this kind where only a selection of species can be included the problem of what to include and what to omit must always give rise to difficulties and lay the author's decisions open to criticism. But the adaptation of this originally German work for use by British botanists could surely have been done better. Why include non-British species such as *Trapa natans*, *Calla palustris* and *Salvinia natans* or such very rare species as *Najas marina*, *Cicuta virosa* and *Naumburgia thyrsiflora*, yet omit such common aquatics as *Montia* and *Apium inundatum*? Of the four grasses included one is non-British and the common pondweeds *Potamogeton pusillus* and *P. berchtoldii* are omitted though the less frequent *P. obtusifolius* and *P. compressus* are included. This is useful within its limitations and especially so for its illustrations.

W.A.S.

Fierce Encounter by H. D. Williamson. Pp. 154, with black and white illustrations by William Cooper. A. H. and A. W. Read; agents, Bailey Bros. & Swinfen. £2.60.

At first glance this book, with its sub-title "life and death in the Australian Bush", looks a bit dramatic and suggests the usual pattern of Nature — red in tooth and claw. However, and quite refreshingly so, it is not entirely a bloody saga, but a nicely balanced set of excerpts from the lives of a range of Australian wildlife and the aborigine people.

The faunal coverage ranges from Wedge-tailed Eagles and Frogmouths, to Shearwaters, Dingos, Black Swans and Red Kangaroos, and includes two outstanding chapters on Ospreys and the Golden Water Rat. The latter must surely be an anthologised item in the future and is one of the finest pieces on a small mammal I have ever read. A chapter called The Long Reef, which deals with some of the shore line waders, is also worthy of comment, as is Reprieve, a conservation message wrapped up in the attitudes of a farmer and his bird-watching son towards a pair of Peregrines.

The Aborigines are featured in essays on a kangaroo hunt and the pursuit of a Dugong, and the author's terse but easy style brings life, without unnecessary embroidery, to these day to day activities. It could be that a new school of natural history writing is developing in Australia, where new and old inhabitants need to understand and appreciate their fauna and native cultures before they are lost. Books like this will go a long way to accomplishing this in the best possible way, without undue sentiment, blood lust or sighing after vanished glories.

The illustrations of William Cooper are excellent and form a perfect complement to the text.

T.M.C

Ecology of Fresh Water by Alison Leadley Brown. Pp. xi + 129. Heinemann Educational Books Ltd. London. £1.50.

This little book should provide interesting reading for amateur naturalists as well as for the sixth form and first year students for whom it was chiefly written. It covers the subject in a very practical way and much of the material is drawn from the author's own experience of field work with young people. There are many pleasing drawings as well as a variety of photographs.

Topics discussed include general aspects of the habitat, aquatic plants and animals, factors affecting the distribution of the organisms, trophic relationships and energy-flow, as well as studies of distribution and density of organisms. Finally there is a chapter on man's influence on freshwater communities, and some practical appendices. Here, on p. 115, there appear to be some misprints in the details of Winkler's method of estimating dissolved oxygen and in point (3) on this page, "B" should read "D".

The book is a useful addition to the *Heinemann Scholarship Series*. The treatment of the subject is different in many ways from that of an earlier book by Popham in the same series. It may be intended to replace this earlier work, though the two are at least in part complementary. N.V.M.

Ocean Life in Colour by N. B. Marshall, illustrated by Olga Marshall. Pp. viii + 412 with 80 colour plates, 8 monochrome plates, 20 text figures and two charts. Blandford Press. £1.25.

This is an admirable addition to the Blandford Colour Series, written by an expert and beautifully illustrated by his wife. From diatoms, flagellates and protozoans through to fishes and marine mammals all orders are covered. There are in addition six chapters dealing with the nature of the ocean, the development of marine biology, food webs, patterns of reproduction and of marine life. The author's presentation throughout matches the fascination of his subject while the beauty of the coloured illustrations, which portray more than 290 species, and the high quality of their reproduction make this book unusually good value for its modest price.

Wildlife of Wales, catalogue No. Red 96M, **Woodland Birds**, catalogue No. Red 103M, **Back Garden Birds**, catalogue No. Red 109M, all B.B.C. Radio Enterprises, 1971. 33½ R.P.M. £1.07 each.

When, in the October-December copy of the *Naturalist*, I reviewed some records from this series, I remarked upon their high technical and artistic standard: all the three discs of this review are worthy of the same favourable comment.

Eric Simms introduces the sounds, but on *Wildlife of Wales* there are three other speakers, William Condry tells us of the Welsh scene and its wildlife, R. M. Lockley speaks on Skokholm, while Peter Conder talks about the Kite's position and status in the Principality. All speak with knowledge and authority and add a great deal to the enjoyableness of the record. Peter Conder's remarks on the Kite strike a note of cautious optimism. However, it is probable that this season's breeding success will be lower than was last year's and there is no doubt these birds still need all the protection possible.

The bird calls that particularly appeal to me on this disc are the rippling notes of the Kite, the Dunlin's referee's whistle of love and perhaps most of all the lovely song of the Golden Plover. Animals are not neglected and it widens one's experience to hear such rare predators as Pine Martin and Polecat.

Woodland Birds takes one through the year in our broad-leaved woodlands and many of the very well-known voices of the habitat are beautifully recorded, the dawn choruses of the various spring months being exceptionally interesting. On Band 3 I particularly liked the roding Woodcock and the voices of the Finches. One seldom has the opportunity to listen to the Hawfinches miscellaneous collection of notes.

Back Garden Birds, with its collection of housewives' favourites, will probably have the widest appeal. However, the scope of this record goes well beyond the limits of a back garden, and on the second side where the outer suburbs, reservoirs and sewage farms are dealt with, the voices of many Waders, Ducks and Swans may be heard. Many insect sounds are recorded, including the squeaks of the Death's Head Hawk Moth and the chirps of a House Cricket. It is surprising how many of the insects have been recorded abroad, the Cricket in Prague, Bluebottle in Malaya, while the Gnat's note was collected by the Czech Radio.

In addition to the mechanical sounding chatter of the House Mouse, there are many animal voices on this disc; both Badger and Fox, being found in the suburbs of our large cities, deserve their place. A.G.

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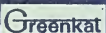
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Chislett Memorial Lecture Huddersfield, 18th March 1972.

Peter Conder, the Director of the Royal Society for the Protection of Birds, will take as his subject — "Kills, Injures or Takes".

Will member Societies please make a note of this in their local programmes. Fuller details later.

Y.N.U. NEWSLETTER

The Y.N.U. Newsletter, sent to all Full members and Affiliated Societies, is published three times a year: February, May and November. Its aim is to provide a means of intercommunication between all members by giving, for example, reports on Y.N.U. and Society meetings and activities, items of Broad Natural History interest, details of all types of surveys and enquiries. All items should be sent to the Newsletter Editor: Mr. H. T. James, 238 Sigston Road, Beverley, Yorks.

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THE HERON POPULATION OF YORKSHIRE

By T. R. BIRKHEAD

National heronry censuses in 1928 (Nicholson 1929, 1930), in 1954 (Burton 1956, 1957 and Garden 1958) and in 1964 (Stafford in prep.), have provided a longer series of data on the size and fluctuations of the breeding population of the Heron than is available for any other species in Britain.

The pattern of the main fluctuations is now well known—there is a marked decrease in breeding pairs after each hard winter, but numbers then regain their former level within a few years providing no further cold winters intervene. However, ignoring the short-term effect of hard winters, the population as a whole has probably remained nearly constant since 1928 and probably for a considerable time before that (Nicholson 1929). Parslow (1967) in commenting on the Heron in Britain stated that a fairly general decrease may have affected parts of North East England and also that numbers were greatly reduced in parts of Yorkshire.

This paper is an attempt to outline recent changes which have occurred in the Heron population of Yorkshire. It has been difficult to accurately assess the situation and some confusion appears to have arisen as to the number of breeding pairs in the county. This is due to incomplete counts of the heronries from the late 1950s to the mid 1960s coupled with the lack of recently published material. Information has been obtained from various sources and in order to provide the long-term background for more recent figures data from 1940 are included.

RESULTS

In Table 1 the total of breeding pairs counted in Yorkshire is recorded for the years 1940 to 1971. The table also shows the number of heronries involved and the number of heronries not counted. Figure 1 records this information as a histogram—in years where data for a colony are lacking a careful estimate has been made. This has been done by taking the mean (to the nearest whole number) of the previous year's figure and next available figure, providing the gap between figures is not more than three years. No estimate is made for the years 1958-1966 or 1968 and 1969 as in these years information is so scanty that this is not practicable. In Figure 2 all available information for most of the colonies is expressed as a series of histograms. Years where no data are available are left blank.

THE HERONRIES (Extinct colonies are treated separately)

- (61) Scampston: Present in 1905 with eight nests (Nelson 1907). Gaps occur in the results between 1940-48 and 1958-64. Most nests are in Scots Pine (*Pinus sylvestris*) at present.
- (62) Kirkdale: A single pair bred in the area in 1943 but the present colony was not founded until 1953. A rambling heronry with all nests in Scots Pine at present.
Sproxton: This small colony was first recorded in 1956. Breeding here may be sporadic—in some years the nearby Duncombe Park may be used as an alternative site. All nests at present in Larch (*Larix* sp.).
- (63) No known colonies within the 1940-1971 period.
- (64) Healaugh: First mentioned in 1922 with eight nests. There is no evidence for a change of site since then. Most nests in Oak (*Quercus* sp.).
Coniston Cold: A heronry is listed by Nelson (1907) at Flasby near Gargrave in 1865. In subsequent years the site varied in location. The site at Gargrave was felled about 1961, after which birds moved to Coniston Cold. Most nests are in Larch.
Sleningford: Chislett (1953) mentions this as an ancient but missed heronry. It is not referred to in the 1928 census, but in the 1954 census it is listed as being rediscovered in 1946. The site has moved several times. In 1971 most nests were in Larch.
- (65) Kirkby Fleetham: A continuation of the Kilpin Hall colony from about 1950 and from this date up to 1966 there are no records.
Sedbergh: This colony appears to have been founded in 1965 and has increased considerably since then.

Table 1. TOTAL NUMBER OF BREEDING PAIRS.

Year	No. of Heronries	Total	Heronries not counted
1940	8	136	Scampston.
1941	6	75	Hornsea, Moreby, Scampston.
1942	7	92	Healaugh, Scampston.
1943	6	84	Healaugh, Hubberholme, Scampston.
1944	4	65	Healaugh, Hornsea, Moreby, Gilling, Scampston.
1945	4	64	Hornsea, Hubberholme, Kiplin, Moreby, Scampston.
1946	9	127	Scampston.
1947	8	61	Scampston.
1948	7	57	Moreby.
1949	8	91	
1950	7	100	Whixley, Sleningford?
1951	7	96	Whixley, Sleningford.
1952	9	107	
1953	8	84	Gargrave, Gilling.
1954	11	122	
1955	7	60	Healaugh, Whixley, Moreby, Gilling, Bolton by Bowland.
1956	9	75	Healaugh, Moreby, Bolton by Bowland.
1957	12	124	Kirkby Fleetham.
1958	8	66	Healaugh, Scampston, Gilling, Sleningford, Kirkby Fleetham.
1959	6	35	Gargrave, Hornsea, Sproxton, Scampston, Sleningford, Kirkby Fleetham.
1960	7	47	No data.
1961	2	21	Healaugh, Harewood, Gargrave, Sleningford, Scampston, Kirkdale, Sproxton, Kirkby Fleetham.
1962	5	36	Healaugh, Scampston, Gargrave/Coniston Cold, Sleningford, Kirkby Fleetham.
1963	4	12	Sleningford, Scampston, Gargrave/Coniston Cold, Healaugh, Kirkby Fleetham.
1964	3	24	Sleningford, Scampston, Coniston Cold, Sproxton, Kirkby Fleetham.
1965	4	23	Healaugh, Sleningford, Sproxton, Coniston Cold, Kirkby Fleetham.
1966	4	18	Healaugh, Sleningford, Sproxton? Coniston Cold, Kirkby Fleetham.
1967	9	57	
1968	No data		
1969	No data		
1970	7	c100	Sedbergh.
1971	9	210	

EXTINCT HERONRIES

During the period concerned eight heronries were abandoned.

Moreby Park (61): A colony of some fifty pairs present in the late 1800s. A drop from fourteen in 1958 to three in 1959 was followed by no birds breeding in 1960.

Hornsea (61): The colony was established in 1880 (Nelson 1907) but birds were breeding in the area long before then. Numbers began to decline in 1958; there was no proved breeding in 1970 or 1971.

Gilling (62): There were eleven pairs in 1928. The site was abandoned, after no marked decline, in 1958.

Gisburn (64): Present in 1906 (17 pairs); persecution and felling brought about several changes of site between 1934 and 1939. Further disturbance resulted in the extinction of the colony after 1941.

Ripley (64): a very small and short-lived colony, being founded in 1950 and then extinct in 1956.

Bolton by Bowland (64): This may have been a continuation of the Gisburn colony, but records are few. After rapid decline became extinct in 1960.

Harewood Park (64): Another very old colony having been in existence since the mid-nineteenth century. Numbers began to decrease after 1955, then the combination of gales and the 1962/63 winter probably finished the colony off. No birds bred after 1962.

Whitley (64): After being discovered in 1949 (three pairs) it built up to a peak of nine pairs in 1962 but then was abandoned in 1963.



FIGURE 1. Number of breeding pairs in Yorkshire

FACTORS AFFECTING THE POPULATION

Results of the National Heronry censuses since 1928 have shown that a 'normal' population exists; in England and Wales this is about 4,500 pairs. The major deviations occur after hard winters as in 1946/47 and 1962/63, when numbers decrease. However, numbers usually regain their former level after three years (Alexander 1945), showing that under certain conditions the population can recoup losses fairly quickly. Smaller irregular fluctuations occur around the 'normal' level. The 1954 census (Burton 1956) showed that in England and Wales the maximum variation was only 400 pairs either above or below the 'normal' level.

Other factors must be responsible for the smaller fluctuations which occur.

- (1) Shooting: Fishing interests have often led to heronries being 'shot up'. Without detailed information it is difficult to assess the effect of shooting. Herons have been shot at the Sleningford site nearly every year in the past but birds return to breed each year in small numbers. Shooting was probably a major reason for the recent change of site.
- (2) Indirect disturbance: The shooting of Corvids, especially Rooks (*Corvus frugilegus*) and Jackdaws (*C. monedula*) and also Wood-Pigeons (*Columba palumbus*) in heronries during the breeding season is possibly responsible for reduced success. Human disturbance may be directly correlated with predation by Crows (*C. corone*).
- (3) Pesticides: A survey of organochlorine residues in tissues and eggs of wild birds in Britain in the early sixties showed that the Heron carried the highest residues of any species examined (Moore and Walker 1964), virtually every individual contained residues of DDT (as the metabolite pp'-DDE), Dieldrin and polychlorinated-biphenyls (PCB), (Prent 1969). Although some individuals have probably died from dieldrin poisoning the numbers in the breeding population have not decreased (Prent 1969). Even though the decline of some Yorkshire colonies coincides with the widespread use of pesticides there is insufficient evidence to implicate toxic chemicals.

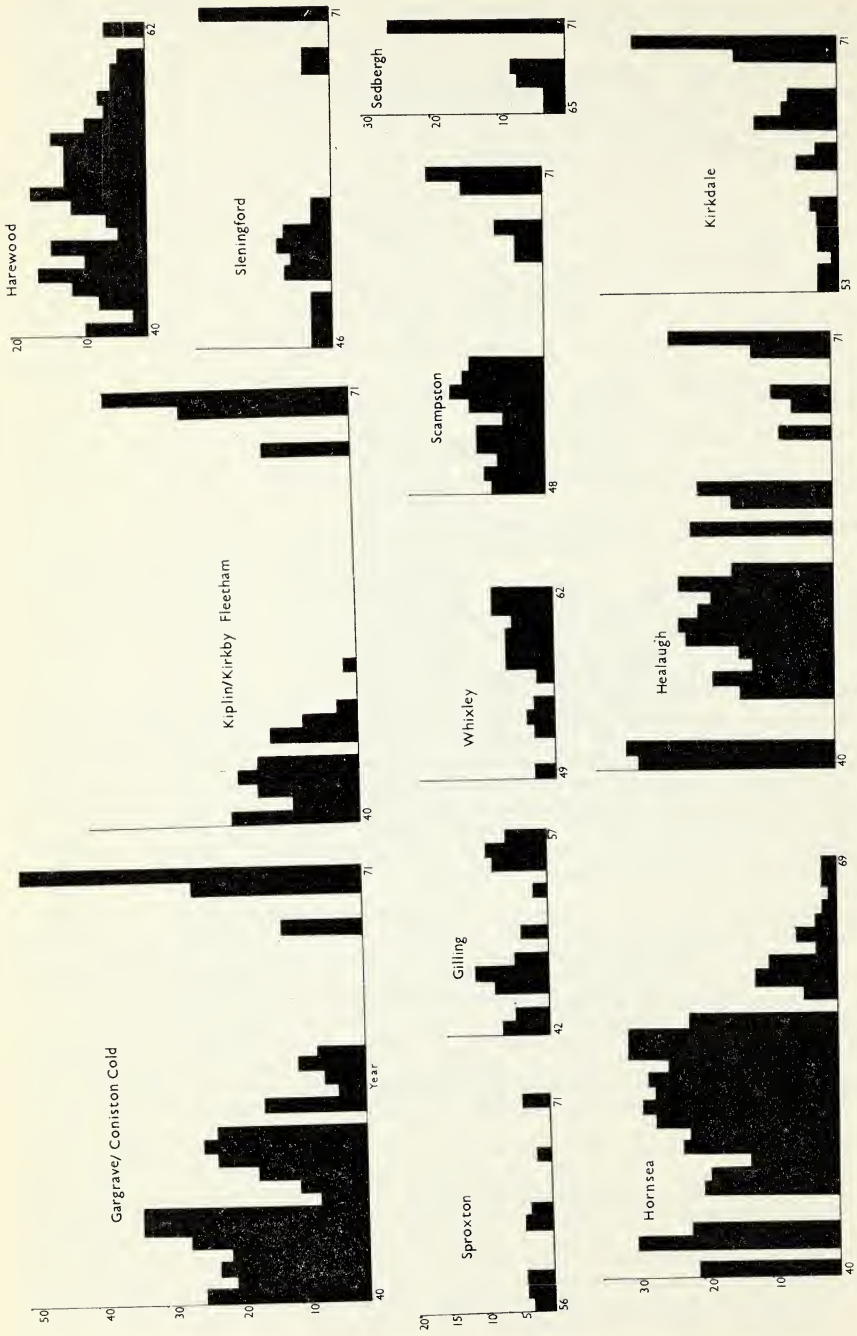


Figure 2. Fluctuations in breeding pairs in 12 sites

- (4) Loss of trees and change of site: The loss of trees, due either to felling or gales usually results in the formation of a new colony within three miles of the original one. This has happened several times and invariably the new site remains undiscovered for several years. The Gargrave site (64) was felled about 1961 but it was not until 1967 that the new colony at Coniston Cold was found. Similarly the Slensingford colony (64), because of persecution in the interest of angling, began to move about 1968 to another wood just under a mile away. A small number of birds nested in the original heronry in 1970 but it was not until 1971 that the new site containing nineteen nests was found. The same again probably occurred at Kiplin Hall (65) where, because of disturbance the birds began to move in 1948 to a new site approximately one mile distant, which was not found until 1967. This is one of the major difficulties in interpreting results — it may occur that a further colony is discovered in subsequent years.

SINGLE NESTS

Only five isolated nests were discovered in thirty-one years. 1943 Kirkdale (62), 1944 Bolton Abbey (64); there was an unsuccessful attempt by a pair at Farnley Park (64) in 1962, Gouthwaite (64) in 1965 and a pair supposedly bred in the Ripley area (64) in 1966.

DISCUSSION

Between 1940 and 1957 the mean number of breeding pairs in the county has been estimated. Disregarding the effect of the 1946-47 winter, the population fluctuated between 98 and 140 breeding pairs, the mean figure being 106.7 pairs.

A count involving all known heronies in 1967 found only 57 pairs breeding — indicating that recovery from the 1962-63 winter had been slow. However, by 1970 numbers just exceeded 100 pairs indicating that by this date recovery was complete.

The marked increase in 1971 is probably due in part to the exceptionally mild 1970-71 winter and the discovery of two new breeding sites. However, herons do not observe county boundaries and the rise in number in Yorkshire may well be balanced by a decrease elsewhere.

A new heronry in VC 64 containing four pairs is not being disclosed as the colony is of a critically small size and it is desirable that disturbance be kept to a minimum over the next two or three years.

The extinction of the Hornsea site may mean that there exists an undiscovered colony in VC 61, an area which in the past has supported fifty or so birds.

The Yorkshire population will be reviewed in a further paper within the next few years, by which time it is hoped that further information of past years and possibly new colonies may have come to light.

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THE PSEUDOSCORPION *LAMPROCHERNES GODFREYI* Kew IN BRITAIN
C. A. HOWES,

On the 1st September, 1970, a stable fly *Stomoxys calcitrans* (L.) was caught at Bessacarr, Doncaster. Clinging to one of its legs was a specimen of the rarely recorded *Lamprochernes godfreyi* (Kew) which, according to available records, represents the twelfth occurrence for Britain and Ireland and the second for Yorkshire.

It is well known that pseudoscorpions attach themselves to the appendages of other arthropods, notably Diptera and Opiliones, and members of the genus *Lamprochernes* are particularly renowned for clinging to the legs of flies as a means of phoresy. Jones (1970) illustrates the value of the phoretic relationship between *L. nodosus* (Schrank) and the house fly (*Musca domestica* L.) as being a method employed by *L. nodosus* for dispersal from relatively temporary situations such as manure or compost heaps.

Judging from the available data (see appendix) *L. godfreyi* appears to have a similar way of life to that of *L. nodosus*, being recorded almost entirely from either manure or compost heaps etc., or from the legs of flies, though how these factors fit into the life cycle of this species is as yet unknown and would reward further study. A method of capturing specimens of *Lamprochernes* is to suspend lengths of the old "sticky" fly paper near to compost or manure heaps and to periodically inspect the captured flies for attached pseudoscorpions. Notes on numbers, months of occurrence, age of the specimen and species of host would be of great value.

ACKNOWLEDGEMENTS

I would like to thank Mr. P. E. Jones for supplying records of *L. godfreyi* and Mr. P. Skidmore for identifying the stable fly.

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APPENDIX

Specimens taken from flies' legs.

- South Norwood. H. Hill (Kew 1911)
Hatfield, Hertfordshire. F. G. Pitt (Kew 1911)
Rathmins, Co. Dublin. N. E. Stephenson (Kew 1911)
Belfast, Co. Antrim 1915. J. A. Sendall.
Bowden, Cheshire. 1916 (Lanes and Cheshire Fauna Committee Report 1917)
Bessacarr, Doncaster 1/9/1970. C. A. Howes.

Specimens from vegetable matter, manure or compost heaps.

- Petersham (Kew 1911)
Newport, Isle of Wight. E. A. Butler (Kew 1911)
Oban, Argyll. C. D. Soar (Kew 1911)
Surrey. November 1948. R. F. Walker. Brit. Mus. Colln.
Leeds 1921 (Falconer 1922)

Others

- Dover. October 1880. W. P. Hayden

The Insect World by S. A. Manning. Pp. 64 with 39 photographs in black and white. World's Work Ltd., The Windmill Press. £1.50.

This slim volume is written, we are told, as an introduction to the exciting world of insects for the child with an enquiring mind. We are not told for which age group the book is designed. My fourteen-years-old daughter thought it would be of interest to "younger children" and my nine-years-old son declared it to be, "very good". The photographs are of a high standard, the text is straightforward and contains many stimulating suggestions for youthful field work. One wonders though how some of our Union colleagues would react if all the children who read the book were to follow the author's oft repeated advice to take their insect specimens for identification to the naturalist at their local museum!

It is a pity that the price will put this book out of the reach of most of the youngsters for whom it is intended and discerning adults will easily be able to find better value for their money.

R.C.

ASPECTS OF OTTER DISTRIBUTION IN THE NORTHERN VALE OF YORK

C. SIMMS

These notes summarise results of searching for indications of otter *Lutra lutra* L. during and after a national survey of the status of the species (1). The work was carried out mainly during the winters of 1967-8 and 1968-9 in the North Riding of Yorkshire, supplemented by a little work at selected places during other seasons. Regular observations were chiefly made at some of the more accessible points along the main rivers which it was considered on *a priori* geographical grounds otters might visit and mark. Results indicated, however, that many more minor waterways should have been examined and it is hoped that these notes and inferences will encourage other naturalists to find and learn more about otters, in their own districts.

THE RIVERS

Most attention was paid to the northern right-bank tributaries of the Ouse (Ure, Swale), the smaller left-bank tributaries (Wiske, Cod Beck, Kyle, Foss) and parts of the lower courses of the Tees and the Derwent within the Vale of York (2). The Tees-tributary and the moorland-enclosed Esk systems were not studied on this occasion; a little work has been started subsequently. South of York the Ouse was visited to its junction with the Derwent, and that river was investigated upstream through its seasonal washlands in the Vale of York to the Howardian ridge at Malton. The Vale of Pickering, except for its linking corridor with the Vale of York at the Coxwold-Gilling gap, was not studied although there was some introductory information available (3). No attempt was made to link apparent otter movements with any adjacent region; and it was considered that the north-western hill streams and the Humberhead regions would repay detailed study along lines indicated by Hurrell (4). One shortcoming of this study is that it was based on the general premise that otters would leave most signs of their presence along the major waterways and especially at confluences and other focal points. In fact, the study showed that otters "portage" many short cuts across interfluvies and that their habits might be influenced by, amongst other factors, flooding on some of the major rivers and angling pressure generally.

PREVIOUS WORK

There are scattered references to otters in the North Yorkshire lowlands in several periodical publications including newspapers, hunt reports and *The Naturalist*; most refer to animals killed or sight records, occasionally of family groups. Some of these (abstracts deposited at the Yorkshire Museum, York), were useful pointers, but none were so valuable in this respect as some unpublished manuscript notes of local naturalists dating from the 1920 and 1930 decades (3), or the recollections and remarks of a very few non-naturalist observers — a situation emphasising how much natural history material is as yet "unquarried" in Yorkshire and how little is often available from the usual published sources. Confidences will not be divulged here, but three main impressions emerged for the period 1920 to 1950:

- (i) That there were many regularly-used breeding sites (holts) in main river banks. Very few of those traced in this study were in use in 1967-9.
- (ii) That there were equally traditional "runs" (portages) across interfluvies and between stream headwaters across watersheds. Several of these were still in use.
- (iii) That otters were to be found breeding within short distances of urban and other human settlement. This still applies to a few holts, but not in main river banks.

METHODS ON THE GROUND

Visual records of wild otters are rare, even amongst those who devote much time over long periods to their field study. Their signs, once known, are relatively easy to find, especially as the main habitats are easy to locate — rivers, other waterways, lake margins and the coast. Signs found in North Yorkshire during the study period can be classified as follows, in descending order of significance: (a) Faeces or scats (spraints) were easily found once their regular depositing-places were recognised. They were often, when relatively fresh, associated with the fairly distinctive otter scent, easily learnt otherwise in zoos. Some places must

have been regularly used, especially emergent stones and buttress-platforms under bridges and near confluences and runs. These sites were usually well within the summer channels of braided rivers, and consequently often washed clean in spates. In the central Vale where there are few large stones, old flood-debris heaps and pulling-out places low along the banks (but often under an overhang), and even boathouse steps, were used. Sprinting-places were best found wading downstream following the quieter bank; some were obvious enough to be seen from a distance or from a bridge. They were either more richly vegetated than other rocks, or appeared capped with mosses or heavy stains. The scats themselves appeared dark brown and black when fresh, ash-grey to white when dry and old, typically cylindrical and more or less curved to about 4 inches long and $\frac{1}{4}$ inch wide although their form varied with contents, and very much smaller, rounder scats were found where young were present. Rather shapeless masses were often blackish and appeared very oily (as distinct from merely mucous-coated) or tarry in consistency when fresh. These were a result of feeding largely on eel (*Anguilla*) (5). Mink (*Mustela vison* Schreber) scats were both smaller and neater, and lacked the otter scent, but were collected from some similar sites. Many (over 20%) of scats seen were not clearly attributable to either species from what was considered good circumstantial evidence on the ground, and these were not collected.

- (b) For an animal considered very aquatic, runs were as conspicuous as badger-trods; their positions and directions sometimes were contrary to the likelihood of their being used much by many other species (6). They penetrated deep carr and other thicket cover, used culverts, but also crossed roads (one near York being the scene of at least three otter road casualties over the past fifteen years), and typically began and ended at or near watercourses. Their currency could be confirmed by otter footprints (seal), but these usually were blurred or confused, not always showing each digit and very rarely the web; their interpretation even along river mud was often difficult. In mud and snow the tail trace was sometimes conspicuous.
- (c) The resting-places of otters are traditionally divided into 'holts' (permanent or regular, including breeding shelters) and 'hovers', (temporary, and including surface lying-up places). Of eight Vale of York holts visited in 1968 only one was within the banks of a major river, whereas five were in thickets, beside drains and beside a pond at distances varying between 200 and 2,000 metres from a stream or river big enough to carry game fish. The other two known holts were well within 200 metres of a river course but in the thick cover of backswamp hedgelines (7). All holts had at least two entrances; one opening into dense cover or (in three cases) under water, one other in a 'play' area of trampled and littered earth or grass. Three holts were close to human habitation (one was revealed after some village boys had been found playing with a cub), two others were very near railways, one was at a field-junction pond with only very local cover and accessible from a river by a ditch, culvert and fields. There was evidence of otters using the straight new drains, with little or no cover, of the extensive recent and current drainage schemes. Two of the holts have, since 1968, been rendered useless for otters by agricultural operations such as hedge-removal, pond-draining and thicket-clearing. It was perhaps not surprising that two main negative opinions were met; that otters had gone or were probably extinct and that otters only visited the Vale, no longer breeding there.
- (d) Perhaps because of the changed nature of their holt sites some of the signs traditionally associated with riverbank holts were rarely seen (8). Slides into the river for example have often been described for *Lutra lutra* and *L. canadensis* but were only once found poorly developed at a backswamp locality, where a 4 foot chute about 8 inches wide dropped into water only a few inches deep. Other evidences of otter play were much more frequently found. The litter of the flattened play areas included twisted lengths of loosened grass (often of strandline origin at those holts near water) and sometimes piles of sand or gravel a few inches high which seemed to have been scooped up and patted round. Fresh flood sand had been gathered superficially from an area of several square metres near the backswamp chute and was variously disposed on successive visits. On similar mounds near another holt, heaps up

to six inches across, discarded remains of food (fish gill-covers, long bones of Water Vole (*Arvicola* sp.)) had been placed or left as on tables. The small spraints of the young were scattered amongst twisted grass and herbaceous stems at anotherholt, where both these and small pebbles up to 1 inch across might have been used as toys as described in some of the literature (8). A small, rounded spraint on a slender tree-stump and a drink-can finger-loop in the same place a week later might have been placed by otters.

- (e) Hovers, by their very nature, cannot be expected to be found easily by the inexperienced; we found only one or two main-river shelters under roots and overhang which seemed to carry otter scent, and were shown three or four others along the same river; one an open thicket-bed such as a fox (*Vulpes vulpes* L.) or badger (*Meles meles* L.) might also occasionally use. These were rather unconvincing, but knowledge of the hovers along otter-routes would be essential for any serious study of this obviously very mobile animal (8). We followed one trail overland in snow for about a mile but even so found no hovers then, and there seems evidence from hunting interests that individual otters (at least outside their breeding season) may travel up to ten or fifteen miles overnight. All our observations indicated nocturnal activity.

INDICATIONS OF THE FOOD OF OTTERS

This table summarises results of the brief analysis of approximately sixty recent spraints and ten collections from 'tables'. Determination of prey items was by comparative methods; for mammals mainly hair (9) (but also a few vole teeth)(10), for birds long bones and some plumage (11), for a single amphibian limb bones, for fishes scale, bone and fin material (12) and for arthropods chitinised fragments (11). Most spraints contained some fish scales, and the next most significant prey group was the voles; at two holts vole remains bulked larger than all other elements together. These are qualitative results only; a shortcoming of the method is that a few hairs in one spraint may be marked down to vole, a few scales to some fish, whereas another spraint may consist *very largely* of such recognisable material but still be marked down as a similar unit.

TABLE. Food Remains of Otter, Northern Vale of York, 1967-9

	In 60 Spraints	At 10 tables
MICROTINAE	38	6
<i>Arvicola</i> sp	23	6
<i>Microtus</i> sp.	11	—
incertae sedis	4	—
AVES	9	3
incertae sedis	7	1
Passeriformes i.s.	2	1 (pullus)
<i>Larus ridibundus</i>	—	1 ? as carrion
AMPHIBIA	2	—
<i>Rana</i> sp.	2	—
PISCES		
Salmonidae	10 probably all	1 (<i>Thymallus thymallus</i> (L.))
Cyprinidae	29 Not differentiated	2 (both <i>Rutilus rutilus</i> (L.))
Cobitidae	—	1 (<i>Cobitis taenia</i> L)
Anguillidae	35 (<i>Anguilla anguilla</i> (L.))	—
ARTHROPODA: Crustacea	—	2 (<i>Astacus</i>)
Insecta	4	—
Coleoptera	4 (<i>Feronia</i> , <i>Aphodius</i>)	—

SEASONAL DISTRIBUTION

There was some evidence of disturbance by Vale of York flooding, especially the major flood of March 1968, but further observation is needed on this, and information was also insufficient to be useful on the problem of when otters breed. The birth-month of cubs was known or reliably inferred at only seven holts. Of these 2 were April, 2 May, 1 or 2 in June, 0 or 1 in July and 1 in October. The occupation of holts (as revealed by sprainting) did not show so clear a spring maximum, but spring tends to be the main flooding period when spraints

would be more likely to be washed out; and spring is the period when, with rivers fluctuating over their beds and undergrowth still low, otters are perhaps easiest to locate except for other snow periods. A great deal of concentrated work needs to be done to investigate possible seasonal movements within and beyond the region, density, and other features.

ACKNOWLEDGEMENTS

The study reported here grew out of fieldwork on related topics, first with Mr. Martyn Rapley and then with the late Mr. Jeffrey Radley. Much advice and encouragement came from Miss E. Hurrell, a North Riding roadmender and a member of an otter hunt who wish to remain anonymous, and there was further valuable assistance from Mrs. J. Holloway and Dr. M. J. A. Thompson. We were never refused access.

NOTES AND REFERENCES

1. Reported briefly in *Oryx*, May, 1969 16-22. Fauna Preservation Society, London.
2. The Vale of York was defined as enclosed by the Durham Plateau, the Cleveland, Hambleton and Howardian Hills, the Wolds, the Humber, the Trent-Don Extension of the East Midlands Plain, and the Pennines.
3. Manuscript material by S. H. Smith and other deceased York Naturalists currently in the possession of the York and District Field Naturalists' Society, and the author.
4. Hurrell, E. (1963): 'Watch For The Otter', *County Life*, 110.
5. Experimental work by C. Simms, proceeding.
6. Personal observations indicated use by domestic cats and a report was received of a marten (*Martes* sp.) using one (in the Vale of Pickering).
7. Radley, J., and Simms, C. (1971): *Yorkshire Flooding: some effects on Man and Nature*, Sessions, York.
8. e.g. Stevens, M. (1957): *The Otter Report Universities' Federation for Animal Welfare*.
9. Determined from comparative specimens according to principles used by: Day, M. G., 1966. Identification of hairs and feather remains in the gut and faeces of stoats and weasels. *T. Zool.* 148, 201-217. Wildeman, A. B. The microscopy of animal textile fibres. Wool Indust. Res. Association, Leeds 1954.
10. Determined from keys and figures in Miller, G. S.: *Cat. Mamm. W. Europe*. London 1912.
11. Determined from specimens in the Yorkshire Museum, York.
12. Determined from specimens in the Yorkshire Museum, York, and in private collections.

The Snakes of Europe by J. W. Steward. Pp. 238, with colour frontispiece and 27 black and white photographs, 10 pp. of drawings, 6 figures and 36 maps. David and Charles, 1971. £2.75.

This work reflects the author's extensive experience and invites comparison with G. A. Boulenger's handbook of the same title (Methuen, 1913) — a source referred to briefly in the preface but omitted from the useful "References and Bibliography". Boulenger's introductory chapters on classification, morphology and habits of snake generally, are still valuable to-day. Steward treats evolution and postglacial history stimulatingly, but includes some speculation and generalisation; we are told (p. 22) that "in water, of course, the method of propulsion is practically identical with that of fish". His view of European fauna (in greater detail in his work on *Caudata*) will need modification as Quaternary biogeography advances.

There have been many changes in nomenclature since 1913; some are covered by Steward's short synonymies. He treats all 33 species and the many races he recognises (for some of which he invents English names) for range, habitat, external morphology and habits; but there is no immediate reference to the distribution maps, headscale figures or plates. The plates are sometimes unhappily placed; an *Elaphe* and a *Vipera* opposite the text for *Ervx*, and another *Vipera* and the *Eryx* opposite the text for *Telescopus* seventy pages on.

The key will probably prove very useful: it uses marking and scales. As the author is careful to point out, some specimens will not key out. An example would be the *Telescopus fallax* here showing divided nasal plate. There is an appendix of vernacular names in various languages, adding to the great practical usefulness of this very pleasantly produced book which is good value for its price. C.S.

**LOBARIA PULMONARIA (L.) HOFFM. TRANSPLANTED INTO
DOVEDALE, DERBYSHIRE**

D. L. HAWKSWORTH

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Lobaria pulmonaria (L.) Hoffm., a large foliose lichen which appears to have been widespread throughout England last century (Rose, Hawksworth & Coppins, 1970, 54) but which is now confined to regions with the cleanest air (Hawksworth & Rose, 1970), was only recorded from a single locality in Derbyshire, Dovedale, where it was collected by the Rev. A. Bloxam probably between about 1835 and 1870 (Hawksworth, 1969, 152). Whilst sulphur dioxide air pollution might be assumed to be the principal factor responsible for its loss from this and other Midland sites (e.g. Charnwood Forest, Sherwood Forest), the felling of trees, alterations in drainage patterns, modifications of the forests, and the collecting of this species as a folk-lore remedy for respiratory diseases could also have been contributory factors. No transplant experiments using this species have previously been carried out in Britain and this note reports the results of transplant experiments conducted to ascertain whether this species is able to tolerate the present microclimate of Dovedale.

Luxuriant specimens of *L. pulmonaria* were removed on bark plugs 10 x 10 cm square from *Quercus robur* in woods by Calf Close Bay, Great Wood, nr. Keswick, Cumberland (Nat. Grid Ref. 35/270215) at 18.30 hr on June 4, 1969, and sealed in air-tight polythene bags. The material was taken to Dovedale and removed from the bags on June 7, 1969, at 18.35 hr. The specimens were transplanted on to the bark of *Ulmus glabra* about 25 yards north of Lovers Leap (Nat. Grid Ref. 43/145522) by removing a piece of bark of the same size and attaching that from the Keswick site by means of nails in its corners. The tree selected was carefully chosen so as to provide a site as similar as possible to the Keswick one (sheltered, moderately well lit, by the River Dove) and placed on the south-facing side of the tree at a height of 1.75 m. The Dovedale site appeared to be an entirely suitable one for this species on the basis of the habitats it prefers in other parts of the British Isles.

The transplant was first revisited on December 28, 1969, and found to be still in a fairly healthy condition although some slight orange-red discolouration was noted near the apices of some lobes and ridges on the thallus surface. A few small whitish areas were also evident on the lower parts of the thallus lobes and there was some evidence that snails or slugs had been attacking a small area of the margin of the transplant.

On March 27, 1970, the whitish patches near the base noted on the previous visit had extended slightly along some of the reticulations and the orange-red discolourations were more noticeable extending in irregular blotches from the apex to about 1 cm. Snail or slug grazing was again noted but in a central part of the transplant, not the marginal area attacked previously which had failed to start to regenerate.

By July 11, 1970, many of the smaller lobes had become slightly erect and the margins inrolled. The whitened areas towards the basal parts of the lobes had extended slightly but the orange-red discolouration was less well marked than on the previous visit. The lobe apices showed a zonal pattern: an outer grey-green marginal zone, a brownish zone, an orange-red zone, and an inner whitish zone. No further snail or slug damage was apparent.

On January 23, 1971, almost the whole of the material had become detached from the bark plug and had fallen on to the ground below. The material on the ground, as well as a few fragments still attached to the bark plug, had become orange-brown with extended whitening in the basal parts. Some of the remaining attached fragments had also developed whitened margins. There was no evidence of any further snail or slug damage since that noted on March 27, 1970, and no fungal parasites were evident. Microscopic examination showed that the algal component (*Myrmecia* sp.) had become decolourized to some extent appearing almost hyaline instead of the bright emerald-green which characterizes it in healthy material of this species.

It is evident that the symptoms shown in the death of the transplants are comparable to those seen in other transplants of lichens into polluted areas (see Le Blanc & Rao, 1966; Gilbert, 1971; Hawksworth, 1971). The discolouration to

orange-brown and orange-red appears to be attributable to the decomposition of norstictic acid, one of the medullary components of this species (Yoshimura & Hawksworth, 1970). It is interesting to note that Gilbert (1971) found the intensity of the reddish-pink discolouration due to the decomposition of salazinic acid in *Parmelia saxatilis* (L.) Ach. to be more pronounced in the winter, for the decomposition of norstictic acid in the *Lobaria* transplants was also more pronounced on winter visits.

When *L. pulmonaria* is moved into completely hostile environments it becomes moribund much more rapidly. Specimens from western Scotland kept in a laboratory in a moist condition at the University of Leicester, for example, showed extensive bleaching and became moribund after only four weeks. In contrast transplants taken from the Lake District and attached to trees of *Acer platanoides* in a garden near the village of Liss in an almost unpolluted area of Hampshire (Nat. Grid Ref. 41/777280) by Dr. F. Rose in August 1969 still survive in a healthy condition (June 18, 1971) with no indication of orange or white discolourations and have produced new growth (c. 1 cm on some lobes) in spite of damage by slugs and birds. It is also of interest to record that Dr. Rose found that material of *Lobaria scrobiculata* (Scop.) DC. taken from Loch Sunart, Argyllshire, in September 1970 and transplanted on to *Quercus robur* in the same area at Rogate, Sussex (Nat. Grid Ref. 41/809236) was almost completely dead after eight months. Hawksworth and Rose (1970) had previously indicated that they considered *L. scrobiculata* to be more sensitive to sulphur dioxide air pollution than *L. pulmonaria*.

The relatively slow death, over a period of nineteen months, in Dovedale appears to be only attributable to sulphur dioxide air pollution in view of the fact that here the environment is otherwise little modified from the type of open forest in which this species still flourishes in the northern parts of the Lake District. The reason for the length of time the transplants took to become moribund may well be due to the need for two winter seasons in order to take up a lethal dose of sulphur. It is known that mean winter sulphur dioxide levels in the area are generally higher than those in the summer months and that thalli are most active physiologically in periods of high relative humidity when they remain moist. Gilbert (1965) has previously proved that the concentration of sulphur in lichen thalli is related to that of the air.

Lichen communities of zone 5 of Hawksworth and Rose (1970), suggesting a mean winter sulphur dioxide concentration of about $60 \mu\text{g}/\text{m}^3$, occur on adjacent trees in this portion of Dovedale. These authors considered *L. pulmonaria* to be characteristic only of their zones 9 and 10 with mean winter sulphur dioxide levels below about $30 \mu\text{g}/\text{m}^3$.

I am very grateful to Dr. F. Rose for allowing me to quote some of his as yet unpublished data.

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RICHARD SPRUCE

On Friday, 3rd September a small ceremony was held at Coneysthorpe when a plaque to the memory of Richard Spruce was unveiled over the door of the cottage in which Spruce spent the last seventeen years of his life. Mr. George Howard presided and the plaque was unveiled by Professor R. E. Schultes, Director of the Botanical Museum, Harvard University. The wording on the plaque, which is in grey-green Westmorland slate with white lettering, reads:

Richard Spruce
1817-1893
of Ganthorpe, Welburn
and Coneysthorpe
Distinguished botanist, fearless
explorer, humble man, lived here
1876-1893

Spruce was one of the greatest traveller-naturalists of the nineteenth century. His immense contributions to knowledge of tropical South American botany are unlikely ever to be equalled by any other one man. A biographical account of his life and work appears in the preface to his posthumously published *Notes of a Botanist on the Amazon and Andes* (1908) edited by Alfred Russell Wallace, a facsimile edition of which with a new foreword by Professor Schultes was issued earlier this year in America. Several other accounts of his travels and achievements have been written but it seems appropriate to recapitulate briefly here the salient facts about the career of this outstanding Yorkshire botanist.

Richard Spruce was born at Ganthorpe, near Castle Howard, where his father was a schoolmaster and he appears to have been educated wholly by his father whose profession he followed briefly, first at Haxby and then at the Collegiate School at York. His interest in botany was developed at an early age and he rapidly acquired a high degree of expertise in both flowering plants and bryophytes, adding *Carex appropinquata* and *Myrinnia pulvinata* to the British flora. Accounts of his bryological discoveries on later excursions to Teesdale, Western Ireland and the Pyrenees firmly established Spruce's reputation as a botanist and led to his selection by Sir William Hooker, Director of the Royal Botanic Gardens, Kew, for the botanical exploration of the Amazon valley.

Spruce sailed for South America in June 1849 and for the next fifteen years he worked ceaselessly sending back to England huge collections of meticulously prepared specimens, accumulating voluminous manuscript notes on a wide variety of subjects in addition to botany and keeping his botanical friends at home fully informed of his activities in a series of long letters packed with detailed and absorbing accounts of his journeys and observations.

After a few months spent in the region around the mouth of the Amazon he started up the river to Santarem at the mouth of the River Tapajos where he met Alfred Russell Wallace who was engaged on zoological investigations. Spruce explored the river Trombetas almost to the borders of British Guiana and reached Manaus at the mouth of the Rio Negro about the end of 1850. The next year was spent exploring the forests around Manaus after which he set out by boat with six companions for the upper reaches of the Rio Negro, spending the next three years there and crossing to the Orinoco by the natural canal of the Casiquiari and penetrating some distance into Venezuela. This trip yielded several thousand collections and many species new to science.

He returned to Manaus at the close of 1854 and then ascended the Amazon by steamer to Peru proceeding by canoe to Tarapoto at the eastern foot of the Andes. Here he stayed two years amassing a very large collection of plants which included 250 different species of ferns collected within a radius of 25 miles. In 1857 he again descended the Amazon and went up the Postasa to Canelos in Ecuador, a journey of some 500 miles by canoe which occupied fourteen weeks. The last part of this journey through the forests of Banos at the foot of the volcano Tunguragua was the most arduous and perilous of all his journeys and much of his baggage was lost or had to be abandoned in the swollen torrents and cataracts of the Topo river. Six months later

he moved on to Ambato where he made his headquarters for two years and where, in spite of the civil war then raging, he explored the region at the foot of Chimborazo and from whence he visited Quito and other highland areas. The period spent in the foot-hills of the Andes, especially at Tarapoto and in the Banos forest yielded the richest haul of bryophytes of all his journeys.

In 1859 Spruce was commissioned by the India Office to collect seeds and young plants of Cinchona, the source of Peruvian or Jesuit's bark from which quinine is extracted. He succeeded with great difficulty in procuring on the western slopes of Chimborazo 100,000 seeds and 600 plants, which were conveyed to Guayaquil for shipment to India. It was from these shipments that the quinine industry of south-eastern Asia was developed — an economic venture which contributed substantially to the wealth of the countries concerned but which yielded him only a modest pension of £100 on his return home.

By now Spruce's health was seriously and permanently undermined and to add to his physical plight he lost practically all his savings when an Ecuadorian establishment in which they were deposited went bankrupt. But for nearly three more years he continued to explore the Pacific coastal areas of Ecuador and Peru before returning to England after an absence of almost fifteen years.

Spruce's collection of flowering plants, numbering upwards of 7,000 species, were worked out by Bentham and others. His ferns, mosses, lichens and fungi were named by the leading experts of the day, while the liverworts — his favourite group — he worked out himself in the cottages at Welburn and Coneythorpe where he spent the remainder of his life. His monumental *Hepaticae Amazonicae et Andinae* published in 1885 contains descriptions of over 700 species, nearly 500 collected by himself and over 400 of these new to science. It still remains the greatest work in South American bryology.

Few travellers have shown greater fortitude, endurance and determination in the face of prolonged privations and hardships. He was never physically a robust man; his great strength lay in his character. Often he was months on end away from all contact with civilisation, he was repeatedly struck down by severe bouts of fever and crippling illnesses, yet these seemed only to generate in him a philosophical detachment from personal troubles and never undermined his total dedication to his mission. The breadth of his interests, the detail and accuracy of his observations and the meticulous recording of all he saw were phenomenal. His collections ranged from the minutest liverworts to the loftiest forest trees, he recorded the uses to which plants were put by the native tribes amongst whom he stayed, the customs and languages of the tribes (he brought home vocabularies of 21 Amazonian languages) and sketched their villages and the country through which he travelled making maps of previously unexplored rivers. Nothing appears to have escaped his attention and capacity for orderly documentation. His *Notes of a Botanist on the Amazon and Andes* contain a great wealth of information on all manner of botanical, geographical, archaeological and ethnographic matters.

Spruce was objective in his letters and writings; he never sought to impress by dramatising his experiences and one's admiration for his achievements and prodigious industry both during his travels and under the severe disabilities he suffered after his return, is enhanced by the absence of any hint of self pity. His close friend Matthew B. Slater of Malton wrote of him as "courteous and dignified in manner but with a fund of quiet humour which rendered him a most delightful companion. He possessed in a marked degree the faculty of order, which manifested itself in the unvarying neatness of his dress, his beautifully regular handwriting and the orderly arrangement of all his surroundings. Whether in a native hut on the Rio Negro or in his little cottage in Yorkshire, his writing-material, his books, his microscope, his dried plants, his stores of food and clothing — all had their proper place, where his hand could be laid upon them in a moment. It was this habit of order, together with his passion for thoroughness, that made him so admirable a collector."

The Y.N.U. had come into existence during Spruce's absence in South America and he was too preoccupied with his collections and too enfeebled in health after his return to resume botanical activities in the district he had investigated so thoroughly in his youth. It is worth putting on record however that he contributed a short account of "Liverworts (Hepaticae) of the East Riding" to part 4 of the Transactions of the Y.N.U. (1882) since this paper is omitted from the list of his 54 books and articles (believed to be "quite complete") appended to the biographical account referred to above.

Such was the man whose memory we honoured at Coneysthorpe. It was a small gathering but it reflected the wide interest which the memorial appeal had aroused amongst botanists in many parts of the world. Letters and contributions in support of the appeal were received from Argentina, Brazil, Colombia, Ecuador, Venezuela, U.S.A., Canada, France, Holland, Sweden and Malaysia.

Professor R. E. Schultes spoke briefly of Spruce's botanical achievements and the width of his contributions to knowledge. No more appropriate person could have been chosen to unveil the plaque for no living person knows more about Spruce or holds him in higher regard. He has himself spent many years in the Amazon valley, retracing some of Spruce's footsteps, has regathered some species never previously collected save by Spruce and has followed up by modern research methods the narcotic and hallucinogenic properties of many of the species the attributes of which Spruce recorded long ago.

The occasion was one on which we recalled with pride a great Yorkshireman. His name belongs to the history of botany and botanical exploration, and one's pride in his distinction is deepened by one's profound admiration for his sterling personal qualities. For truly "He was a man of a choice spirit."

W.A.S.

Skelton Village — The Continuing Community, by Revd. D. H. E. C. Stapleton and Dr. M. J. A. Thompson. Pp. 100, illustrated with photographs, maps and line drawings. William Sessions Ltd., The Ebor Press, York, 1971. 75p.

In 1789 the Natural History of Selborne appeared in print and started a movement of local study which has continued to the present day. The Reverend Gilbert White and his distinguished contemporary Thomas Pennant, were men of parts, capable of looking at wildlife, historical monuments, land use and local customs with the same intelligence and powers of observation which has made their work of lasting value. The Reverend Stapleton and Dr. Thompson have provided a worthy addition to the literature of local studies in their study of Skelton village, which lies three miles north of York.

Though this village is comparatively unspoiled, in 1971 changes are rapid and irrevocable and it is timely that this study should appear now. No doubt the people of Skelton and former inhabitants of the village now living elsewhere, as well as a wide readership beyond the village, will enjoy this book. However, and possibly more important in the long term, the Continuing Community will continue to progress, with every incomer aware of the past and position of the village. The influx of new inhabitants in recent years, as in so many places, could obscure the community feeling which is so much a part of village life. In his epilogue the Reverend Stapleton expresses this very well — "if no effort is made, then, in time, the village only reproduces the conditions of anonymity and loneliness found in towns, which people have come into the country to escape."

The history of the village from Domesday to the present, occupies the first part of the book and is perfectly complemented by Dr. Thompson's contribution on the natural history of the Skelton and Overton parishes. He deals with the ecology of the area, the birds and mammals, and lower vertebrates. Other authors contribute sections of geology (John A. Dell) botany (Thomas F. Medd) and Overton Wood (Gunnar Godwin) to fill out an excellent and well balanced account. Skelton contains no ultimate rarities, but the wide range of its wildlife makes it an area deserving every kind of environmental consideration. Moorlands Wood is a YNT reserve, but it is obvious that the whole area has a high potential in natural history studies, which is being realised through the work of groups from St. John's College, Bootham School, and resident individuals. The mammal studies are excellent, the bird list full of local ecological data, and the plant list of nearly 330 species reflects a lot of hard work.

A book which every YNU member who belongs to a local society, particularly one which is contemplating publication, should read. And if, in so doing, the reader gets drawn into the history of the village, then the authors have achieved the same result as Gilbert White, nearly two hundred years before.

The publishers must be praised for the quality and appearance of the book — the paper, binding and lay-out are excellent.

T.M.C.

CORRESPONDENCE

Dear Sir,

The letter by R. S. Pollard in the last issue of *The Naturalist*, on a young Cuckoo *Cuculus canorus* being reared from one of two pale blue eggs found on a lawn, prompts me to make the following observations.

I consider the account relies too much on supposition for it to be an acceptable record. R.S.P. was no doubt correct in his first suggestion that the two eggs were those of a Starling *Sturnus vulgaris*. Cuckoos very rarely lay pale blue eggs in the British Isles and the date of discovery, 9th May, is the period when most Starlings in Yorkshire are at the end of the incubation period. The fact that at least one of the two eggs was on the point of hatching must not be overlooked and they had obviously been very recently removed from a nest and deposited on the lawn before being found and placed on the stove. I would say that this situation would be impossible if both the eggs were those of a Cuckoo as implied by R.S.P. There is a certain amount of egg loss from Starling's nests during incubation, presumably removed by the parent birds or by intruding Starlings. There is no evidence to suggest that the young bird which hatched on the stove and was then placed in the nest of a Blackbird *Turdus merula*, lived and was reared. It is just as likely that it died and was removed by the Blackbirds or, if it did survive, was ejected by the young Cuckoo which hatched shortly after the departure on holiday of the village lady. Under the circumstances, it is more reasonable to assume that the Cuckoo's egg was already in the nest when the chick was added.

It is a pity R.S.P. does not give more details about the age of the young Cuckoo he recognised on the 21st May. Was it already well feathered, which it should have been at 12 days old, or were its feathers still in pin? These questions are obviously answerable and would give a better idea of its date of hatching.

In answer to R.S.P. in his last paragraph; the question "Why two eggs at different stages of incubation?" is hardly realistic. Why were they not at the same stage of incubation? The fact that only one hatched in what can be termed unsuitable circumstances does not suggest this condition. One may have been infertile or the chick inside may have gone beyond the limit of revival by applied warmth. Day old chicks, especially nidifugous ones and fully developed chicks still in the egg, are capable of withstanding reductions in temperature until they become torpid and can be revived by being subjected to warmth as in the case of the egg which hatched.

R.S.P. then asks, "Why should the Blackbirds accept the young bird?" This species has been recorded several times as a Cuckoo fosterer, and most birds will accept a chick if it is placed in the nest after the potential fosterer has been incubating for some been broody for one day, provided they were quietly placed beneath her.

In reply to "Is there any record of a wild bird's egg being hatched out on an Aga Stove"; I can only say that this may be difficult to ascertain but draw attention to my comments above on general application of warmth to eggs or small chicks. A prison inmate once hatched the egg of a House Sparrow *Passer domesticus* by keeping it in his armpit, and there are several other records of eggs being hatched by the application of artificial warmth, apart from the obvious incubator though in the case under review the heat was only required to re-stimulate the already fully formed chick.

Some time ago Prof. Meiklejohn wrote an amusing article about birds whose identity could not be established precisely. Such birds he named Hoodwinks. If the young bird which successfully fledged from the Cloughton garden nest was in fact the one which hatched out on the Aga Stove, then this should perhaps be claimed as the first breeding record of the Hoodwink, *Dissimulatrix spuria* which has often been credited with the deposition of pale blue eggs on lawns.

JOHN R. MATHER

Calendar of the Countryside for 1972.

As an inexpensive, useful and decorative Christmas gift, we commend this attractive calendar depicting paintings of British animals. Stoat, Pine Marten, Mountain Hare, Hedgehog, Rabbit, Common Seal, Dormouse, Red Squirrel, Harvest Mouse, Badger, Otter and Roe Deer are the animals illustrated, all in full colour. The calendar is published by Christian Action and the World Wildlife Fund in their common interest, is 8½ in. by 5½ in., is designed to stand or hang and is obtainable from Christian Action Publications Ltd., 104 Newgate Street, London E.C.1. price 80p post free.

YORKSHIRE NATURALISTS' UNION EXCURSIONS IN 1971

INGLETON FOR KINGSDALE, V.C. 64 — 29th to 31st May

In spite of wet weather on the first two days which resulted in a rather lower attendance than usual for the Whitsuntide Meeting, we had a most enjoyable weekend under the guidance of Miss H. Lefèvre, amongst the beautiful limestone outcrops of this area. We were glad to have our President, Mr. A. J. Wallis with us on the Sunday. On Saturday and Sunday we explored the scars on both sides of Kingsdale, and on the Monday climbed up over Twistleton Fell, the day ending in magnificent sunshine. Members met for tea and Sectional Reports at the Craven Heifer Inn, Ingleton, when the Chair was taken by Dr. W. A. Sledge. A vote of thanks was expressed by Mrs. A. C. M. Duncan to the landowners, who had so kindly granted us access to their land and to Miss H. Lefèvre, who had organised the programme.

Flowering Plants and Ferns (W. A. SLEDGE)

Kingsdale is rarely mentioned in the literature on the botany of the Ingleton district. Visitors to Ingleton invariably spend their time in the investigation of the glens, of Chapel-le-dale or of Ingleborough, and Kingsdale has been neglected. Just how neglected may be gauged from the fact that — incredibly — *Sesleria caerulea* is unrecorded for SD 67 in the *Atlas* though it is as abundant on the Kingsdale scars and pastures as elsewhere on the Craven limestones.

The scars on the west side of the dale were investigated on the Saturday. These form a very small part of the total area of SD 67 (approximately 2%), but a dozen species were added to the records for this square. These were mostly common species but included such expected plants as *Convallaria majalis* (Lily-of-the-valley), *Paris quadrifolia* (Herb Paris) and *Viola lutea* (Mountain Pansy) all of the last named as its purple-flowered *forma amoena*. A notable feature of these scars and pavement grykes was the abundance of the ferns *Dryopteris villarii* (Rigid Buckler-fern) and *Gymnocarpium robertianum* (Limestone Polypody) which were here in as great a quantity as I have ever seen them. By contrast *Asplenium viride* (Green Spleenwort) and *Polystichum aculeatum* (Hard Shield-fern) were, unaccountably, very scarce. A number of plants of *Actaea spicata* (Herb Christopher) were seen in good flower on Keld Head Scar. The only previous record for this square, made during the *Actaea* survey, was for one or two plants on an inaccessible ledge in a pot hole on Leck Fell on the Lancashire side of the border.

On Sunday the investigation of the scars on the west side of the dale was continued as far as Yordas cave and subsequently the valley was crossed and Long Scar and Braida Garth Scar on the east side were examined. Most of this ground lay in SD 77. The best plants seen were *Potentilla crantzii* (Alpine Cinquefoil) and *Draba incana* (Hoary Whitlow grass). *Thalictrum minus* (Meadow Rue) and *Saxifraga hypnoides* (Mossy Saxifrage) were more predictable species.

On Monday Twistleton Scars and the limestone pavements above the scars were explored. The comparison with Kingsdale was interesting. *Dryopteris villarii* was equally abundant here and *Asplenium viride* and *Polystichum aculeatum* were frequent to common though *Gymnocarpium robertianum* was much less so. *Minuartia verna* (Spring Sandwort) which had been searched for in Kingsdale without success was plentiful. *Antennaria dioica* (Cat's-foot) was frequent and other species not previously observed were *Hippocrepis comosa* (Horseshoe Vetch) and *Geranium sanguineum* (Bloody Cranesbill) single patches of which were seen on the scars overlooking Chapel-le-dale.

Both the Kingsdale slopes and those at Twistleton were everywhere dry and devoid of springs and calcareous flushes. To this must be attributed the rather surprising fact that after three days of botanising on the limestones not a single specimen of *Primula farinosa* had been seen.

Bryology (M. DALBY)

Miss Robertson was the only member of the Bryological Section present at the meeting. She recorded a number of species from Kingsdale (35/67) and Twistleton Glen (35/77) in addition to those recorded in *The Naturalist* 1971, 35-37, when the Section visited Swilla and Twistleton Glens in the autumn of 1970.

From Kingsdale (35/67) she records *Preissia quadrata*, *Reboulia hemispherica*, *Sphagnum subsecundum* var. *auriculatum*, *Fissidens bryoides*, *Pleuridium acuminatum*, *Encalypta streptocarpa*, *Tortula ruralis*, *Weissia microstoma*, *Grimmia alpicola* var. *rivularis*, *Rhacomitrium lanuginosum*, *Funaria hygrometrica*, *Pohlia nutans*, *Bryum*

pseudotriquetrum, *Mnium cuspidatum*, *Philonotis fontana*, *Fontinalis squamosa*, *Orthotrichum anomalum*, *Climacium dendroides* and *Hygrohypnum luridum*.

From Twistleton Fell she added *Leiocolea muelleri*, *Pedinophyllum interruptum*, *Ditrichum flexicaule*, *Tortula ruralis*, *Trichostomum brachydontium*, *Weissia microstoma*, *Funaria hygrometrica*, *Mnium cuspidatum*, *Thuidium philibertii*, *Rhytidium rugosum* and *Rhytidiadelphus triquetrus*.

Ornithology (A. C. M. DUNCAN)

Kingsdale must be one of Yorkshire's smallest dales, situated near the boundary with Lancashire and not far from the nearest part of Westmorland. Even if the dale be small, it held a lot to interest us. Going up the dale we crossed over the Silurian rocks which were being quarried at Skirwith. On higher ground we were on level bedded limestones making scars along the escarpment. These had weathered into typical clint formations and proved a happy hunting ground for the botanists. Kingsdale Beck in the valley bottom was of more interest to the ornithologists.

A Heron was seen flying over each day. On Saturday a large bird of prey was seen flying up the valley; this was taken to be a Buzzard. Another bird of prey, a Kestrel, was seen twice. Near the head of the valley a Blackcock and Greyhen were both seen by different observers, other game birds being Red Grouse and Partridge. Golden Plover were seen on the higher ground holding territory, Curlew nests were found, and Snipe heard drumming. Near the beck Redshank and Common Sandpipers were calling. A Sand Martin nesting colony was found and Swallows and House Martins with young in the nest. In the more wooded part round Braida Garth a Tree Pipit was seen. Meadow Pipts were numerous and seen to be feeding young. Other evidence of nesting was: a Wren's nest; a Willow Warbler holding territory; a Goldcrest feeding young; Blackbird, Song Thrush and Coal Tit all with nests and young. Ring Ouzels were heard singing in several places on the higher rocky ground.

During the three days 52 species were recorded. In addition to those mentioned above, the following made up the total: Lapwing, Oyster-catcher, Black-headed, Lesser Black-backed and Herring Gulls; Wood Pigeon; Cuckoo; Swift; Skylark; Yellow and Pied Wagtails; Dipper; Dunnock; Spotted Flycatcher; Whinchat; Wheatear; Redstart; Robin; Mistle Thrush; Blue and Great Tits; Chaffinch; Linnet; Redpoll; House Sparrow; Starling; Jackdaw; Rook, and Common Crow.

Conchology (A. NORRIS)

The following is the list of species found in Kingsdale on Saturday the 29th of May, collected and recorded by Dr. L. Lloyd-Evans and members of the Conchological Section.

<i>Carychium minimum</i> Müll.	<i>Hygromia striolata</i> (C. Pfeiffer)
<i>C. tridentatum</i> (Risso)	<i>H. hispida</i> (L.)
<i>Lymnaea truncatula</i> (Müll.)	<i>Discus rotundatus</i> (Müll.)
<i>L. palustris</i> (Müll.)	<i>Arion intermedius</i> Normand
<i>Planorbis leucostoma</i> Millet	<i>A. fasciatus</i> (Nilsson)
<i>Ancylus fluviatilis</i> Müll.	<i>A. ater</i> agg.
<i>Succinea pfeifferi</i> Rossm.	<i>Euconulus fulvus</i> (Müll.)
<i>Cochlicopa lubrica</i> (Müll.)	<i>Vitrea crystallina</i> (Müll.)
<i>C. lubricella</i> (Stabile)	<i>V. contracta</i> (West)
<i>Pyramidula rupestris</i> (Drap.)	<i>V. diaphana</i> (Studer)
<i>Columella eduntula</i> (Drap.)	<i>Oxychilus cellarius</i> Müll.
<i>Vertigo substriata</i> (Jeff.)	<i>O. allarius</i> (Miller)
<i>V. pygmaea</i> (Drap.)	<i>Retinella radiatula</i> (Alder)
<i>Lauria cylindracea</i> (da Costa)	<i>R. nitidula</i> (Drap.)
<i>Abida secale</i> (Drap.)	<i>Vitrina pellucida</i> (Müll.)
<i>Clausilia bidentata</i> (Ström)	<i>Lehmannia marginatus</i> (Müll.)
<i>C. dubia</i> (Drap.)	<i>Agriolimax reticulatus</i> Müll.
<i>Arianta arbustorum</i> (L.)	<i>A. laevis</i> (Müll.)
<i>Helix nemoralis</i> L.	<i>Pisidium personatum</i> Malm
<i>H. aspersa</i> Müll.	

The occurrence of *Vitrea diaphana* (Studer) on the screes and at the foot of the crags in Kingsdale, is perhaps the most interesting record. This species which was first recorded in Yorkshire in 1966, is proving to be well distributed on the mountain limestone of West and North Yorkshire.

HUNMANBY, V.C. 61 — 12th June

Mr. E. Chicken, the Divisional Secretary for V.C. 61, provided us with a most helpful sketch map to guide us to the three areas in the vicinity of Hunmanby which we were to visit. These were first, the grounds of Hunmanby Hall School, then Speeton Cliffs where the chalk wolds run out to the sea, and Hunmanby Gap a little to the north of Speeton, where a small stream runs along its wooded valley to the sands of Filey Bay. The weather was excellent and about twenty-five people attended the tea and meeting for reports at the White Swan Hotel, Hunmanby. The Chair was taken by the President, Mr. A. J. Wallis and we were able to meet and welcome the Union's new Secretary, Mr. Frank Thompson, of Scarborough. Mr. C. Disbrey expressed the thanks of the Union to the Headmistress of Hunmanby Hall, who had kindly permitted our visit and to Mr. E. Chicken, for his work in planning the day's varied programme.

Vascular Plants (E. CRACKLES)

Members visited Hunmanby Girls' Boarding School to see some long established denizens, i.e. *Aconitum anglicum* (Monkshood), *Tellima grandiflora* (Fringe-cups), *Doronicum pardalianches* (Great Leopard's-bane) and plants believed to be *Saxifraga umbrosa*, *S. hirsuta* and the hybrid between them.

The party then visited Speeton cliffs and worked a section of the cliff face. The plant associations on this stretch of cliff are interesting but unexciting, particularly when compared with those to be found on the Filey side of Primrose valley. The probable explanation of the lack of uncommon species here, is the north-easterly aspect and exposed nature of the locality.

Species found to be locally common on the upper parts of the cliff are: *Dryopteris filix-mas* (Male Fern), *Silene dioica* (Red Campion), *Lathyrus pratensis* (Meadow Vetchling), *Heracleum sphondylium* (Hogweed) and *Tussilago farfara* (Coltsfoot), whilst *Hypochoeris radicata* (Common Cat's Ear) was also present. In wet areas, *Caltha palustris* (Marsh Marigold), *Angelica sylvestris* (Wild Anglica) and *Pulicaria dysenterica* occurred in quantity, with *Dactylorhiza fuchsii* (Common Spotted Orchid) and *Veronica beccabunga* (Brooklime) also resent. One patch of *Parnassia palustris* (Grass of Parnassus) was noted. A number of calcicoles occur towards the bottom of the slope: *Anthyllis vulneraria* (Kidney-vetch) is locally abundant; *Polygala vulgaris* (Milkwort); *Filipendula vulgaris* (Dropwort); *Poterium sanguisorba* (Salad Burnet); *Thymus drucei* (Wild Thyme); *Plantago media* (Hoary Plantain) and *Leontodon hispidus* (Rough Hawkbit). Woodland species present include: *Dryopteris dilatata* (Broad Buckler-fern), *Viola riviniana* (Common Violet), *Listera ovata* (Twayblade) and *Brachypodium sylvaticum* (Slender False-brome). *Armeria maritima* (Sea Pink) and *Plantago maritima* (Sea Plantain) occurred at the mouth of a small ravine. The presence of the calcifuge *Teucrium scorodonia* (Wood Sage), an uncommon East Yorkshire plant, is more difficult to understand, although *Potentilla erecta* (Tormential), which is also acid-loving, also occurs and *Galium saxatile* (Heath Bedstraw) is locally frequent on the cliff top.

Aira praecox (Early Hair-grass) and *Spergula arvensis* (Corn Spurrey) were seen at the edge of a farm track whilst returning to Speeton village.

Hunmanby Gap was then visited. *Rosa pimpinellifolia* (Burnet Rose) is present in quantity in its well-known station on the cliffs to the south, with *Hypericum pulchrum* (Slender St. John's Wort) and *Cerastium arvense* (Field Mouse-ear Chickweed) also present, whilst *Phyllitis scolopendrium* (Hart's-tongue fern), *Pentaglottis sempervirens* (Alkanet) and *Calamagrostis epigejos* were reported from the adjacent ravine and *Sagina apetala* (Pearlwort) and *Picris echioides* (Bristly Ox-Tongue) from the vicinity of the car park. The rare *Ranunculus parviflorus* was seen along the cliff footpath to the north and *Equisetum telmateia* is locally common on this section of cliff. Other species reported from the neighbourhood include *Ranunculus baudotii* and *Senecio viscosus* (Sticky Groundsel).

The work done during the day was most valuable and a number of species seen had not been recorded previously for the 10 km. square.

Bryology (M. DALBY)

Miss Robertson visited Hunmanby Gap during the afternoon, her records include *Metzgeria fruticulosa* on elder, *Dicranoweissia cirrata*, *Eurhynchium murale*, *Weissia contraversa*, *Cratoneuron filicinum* and *Riccardia pinguis*.

Ornithology (F. J. THOMPSON)

A total of 54 birds were seen during the day. Of the 54, 17 were recorded as breeding as they were seen either carrying food or feeding young.

Collared Doves were quite evident in Hunmanby and were seen in the churchyard and in trees behind the White Swan. A Pied Wagtail was observed carrying food in the grounds of Hunmanby Hall, our first place of call, whilst a Spotted Flycatcher hawked for insects a little further up the ride. A total of 205 Rooks' nests have recently been counted in the grounds.

Grasshopper Warbler, Sedge Warbler, Whitethroat and Willow Warbler were seen at Speeton and at Hunmanby Gap. Whilst at Speeton our attention was drawn by the scoldings of a Yellowhammer and a Willow Warbler to a party of three Weasels passing down the cliffs.

A Cuckoo was heard at Hunmanby and seen on two occasions at Speeton. A Moorhen with two broods was present on Speeton Pond.

The only waders of the day were a Curlew which flew over on our arrival at Speeton, a pair of Oystercatchers on the beach and Lapwings. Small rafts of Guillemots and Razorbills dotted Filey Bay and there was a continuous movement south of Kittiwakes during the period of our observations. Only two Gannets were seen although they are known to nest a little further down the coast.

Other birds seen were: Fulmar, Cormorant, Great Black-backed Gull, Herring Gull, Blackheaded Gull, Wood Pigeon, Swift, Skylark, Swallow, House Martin, Sand Martin, Carrion Crow, Jackdaw, Blue Tit, Wren, Song Thrush, Blackbird, Wheatear, Whinchat, Robin, Blackcap, Chiffchaff, Dunnock, Meadow Pipit, Rock Pipit, Starling, Greenfinch, Goldfinch, Linnet, Redpoll, Bullfinch, Chaffinch, Corn Bunting, Reed Bunting, House Sparrow and Tree Sparrow.

Birds noted as breeding were: Moorhen, Wood Pigeon, House Martin, Sand Martin, Rook, Jackdaw, Blackbird, Robin, Sedge Warbler, Whitethroat, Willow Warbler, Pied Wagtail, Starling, Linnet, Redpoll, Chaffinch, House Sparrow.

Mammals (D. E. MURRAY)

A female Weasel with three young was seen on the cliffs at Speeton and the Long Tailed Field Mouse was there too. A dead Hedgehog was seen near the Dotterel Inn. One Hare was also recorded.

Conchology (A. NORRIS)

Five members of the Conchological Section were present at the meeting, and a total of 26 species of mollusca were recorded from the cliffs at Speeton and Hunmanby Gap. In addition to these records we also recorded 10 species from the grounds of Hunmanby Hall.

The most interesting record of the day was the locating of *Lauria anglica* (Wood), a very local species in Yorkshire, on the cliffs at Speeton, (54/156753), and at Hunmanby Gap (54/127776). This species has been known from the area for over half a century but this is the first time one of these coastal records has been confirmed in the last twenty years.

HUNMANBY HALL GROUNDS

Cochlicopa lubrica (Müll.)
C. lubricella (Stabile)
Discus rotundatus (Müll.)
Arion circumscriptus Johnston
A. hortensis Fer.

Oxychilus alliarius (Miller)
Retinella nitidula (Drap.)
Vitrea pellucida (Müll.)
Agriolimax reticulatus Müll.
A. caruanae Pollonera

CLIFFS AT SPEETON AND HUNMANBY GAP

Carychium minimum Müll.
Lymnaea truncatula (Müll.)
Planorbis leucostoma Millet
P. crista (L.)
Ancylus fluviatilis Müll.
Succinea pfeifferi Rossm.
Cochlicopa lubrica (Müll.)
Lauria cylindracea (da Costa)
L. anglica (Wood)
Ena obscura (Müll.)
Clausilia bidentata (Strom)
Arianta arbustorum (L.)
Helix nemoralis L.

Hygromia striolata (C. Pfeiffer)
H. hispida (L.)
Monacha cantiana (Mont.)
Arion intermedius Normand
A. ater agg.
Euconulus fulvus (Müll.)
Vitrea crystallina (Müll.)
Oxychilus cellarius Müll.
Retinella radiatula (Alder)
R. pura (Alder)
R. nitidula (Drap.)
Agriolimax reticulatus Müll.
A. laevis (Müll.)

Entomology (R. CROSSLEY)

Collecting was confined to the sea cliffs although such an exposed habitat on the North Sea coast is unlikely to produce a great variety of insects. This, indeed, proved to be the case, and those taken were, with only a few exceptions, widespread and common species. Two common flies, the syrphid *Cheilosia intonsa* Loew, and the distinctive sciomyzid *Trypetoptera punctulata* Scop., were new to V.C. 61. The conspicuous caterpillars which were so abundant on the vetches were *Zygaena lonicerae latomarginata* Tutt (Narrow-bordered Five-spot Burnet). This subspecies is confined to the north east coast of England and in Yorkshire it occurs from Bridlington to just north of Scarborough. The cliffs in the vicinity of Filey are the type locality for the subspecies.

A strong colony of bees on a bare stretch of clay was sampled and Mr. J. H. Flint identified the following species for me: *Andrena sericea* Christ., *A. labialis* Kby., *Nomada lineola* Pz., *N. hillana* Kby. Other andrenas are still to name.

Mr. P. Q. Winter has kindly supplied a list of lepidoptera taken by him and this includes *Erynnis tages* L. (Dingy Skipper), *Ectypa glyphica* L. (Burnet Companion) and *Euclidimera mi* Clerck (Mother Shipton).

HOVINGHAM, V.C. 62 — 26th June

The day's activities, under the direction of Mr. Ian Lawrence, the Divisional Secretary, were concentrated in two very different parts of Sir William Worsley's Hovingham estate. In the morning, the many members who attended travelled a mile or two by car to Hovingham Spa and then explored the mixed woodlands and adjoining farmland there. After a picnic lunch, the party then proceeded by car to Wath limestone quarries, to the east of the village.

Reports were presented after tea at the Worsley Arms Hotel when the Chair was taken by our President, Mr. A. J. Wallis. The appreciation and thanks of the Union were expressed to Sir William Worsley, the landowner, and to Mr. Ian Lawrence, who had made all the preliminary arrangements, by Mr. George Shaw.

Landforms (C. SIMMS)

The district is cut out of the Middle and Lower Oolites, here thinner than to the north as in the Hambleton Hills, so that escarpments are less bold and high and more cultivated in appearance. The general aspects are less moorland-edge than soft or 'wealden'. The Kellaways Rock on the hills and the Oxford Clay in the bottoms are the key formations. The Kellaways Rock is a soft sandstone with inclusions of harder rock which weather out to give the characteristic wavy or crenellate outcrop of alternating gentle nabs and wide swales. The rock at Wass quarries is the Upper Limestone, hard, coralline and very fossiliferous. Within the district the drainage pattern is rather confused.

Whatever the details, the low land seems deeply plastered with mud, even though the valley bog visited was very disappointing. The Oxford Clay is rarely exposed: much of the material covering it may be local, from the valley-sides above where the Kellaways Rock easily slips over its quickly-erosible supports. The element of glacial or lacustrine deposits is debatable.

The morning was spent in the valley below and within High Park Wood, where felling has perhaps altered the district substantially since the 1935 meeting. The misfit beck has a sandy bottom; at places working laminae of silts and sands suggest former lacustrine deposits, at least locally. The afternoon was spent between the base-rich ridge between the quarries, and the sinuous misfit valley of the Wath Beck, which was seen to be in a typical subglacial or proglacial channel linking the small Wiganthorpe basin with the Vale of Pickering. The valley-walls were partly wooded with a variety of wild life, including badger setts.

In the evening C. S. and M. H. Hartley led a small party to a drainage excavation near Whenby at about 190 feet O.D. which they are investigating; shelly marl overlies lacustrine clay with remains of *Castor* and some woody detritus in a pebble-and-organic beach deposit of some former water-body.

Vascular Plants (JOAN E. DUNCAN)

The morning was spent in Hovingham Woods where over 100 species were listed. The first species of note was seen on the way there — *Erysimum cheiranthoides* (Treacle Mustard) given in the Plant Atlas as a pre-1930 record for SE 67. In the woodland, of mixed hardwoods and conifers, ferns were growing very well, including bracken to some height; three sedges were noted, *Carex remota*, *C. sylvatica* and *C. pallescens*. The most interesting species was *Trientalis europaea* (Chickweed Wintergreen) and several patches

of this attractive flower were seen beside the rides in the upper part. In addition to *Trientalis*, the following species not recorded for SE/67 in the Atlas, were found in the woods or nearby: *Polypodium vulgare*, *Stellaria alsine*, *Polygonum hydropiper*, *Rumex sanguineus*, *Myosotis discolor*, *Veronica arvensis*, *Luzula campestris*, *Tamus communis* and *Poa trivialis*.

In the afternoon at Wath Quarries some of the party explored the woodland and marshy ground nearby whilst the rest spent the whole time investigating the rich flora in and around the quarries. In all a total of more than 160 species, excluding garden escapes, were recorded.

Potentilla palustris (Marsh Cinquefoil), *Scirpus sylvaticus* (Wood Clubrush) and the sedges, *Carex paniculata**, *C. rostrata** and *C. acutiformis**, were amongst the list of plants made for the first area.

On the bare ground above the quarry were many small colonising plants including *Sherardia arvensis** (Field Madder) and the grass *Catapodium rigidum** and here also were a few plants, not yet flowering, of *Cirsium eriophorum** (Woolly-headed Thistle). In the bottom of the quarry the vegetation was very lush with tall-growing plants flowering profusely — notable amongst these being *Conium maculatum* (Hemlock) and *Thlaspi arvense** (Pennycress). *Crepis biennis* (Rough Hawksbeard) made a good show of flowers along the roadside. Weeds and casuals found in the area included *Coronopus squamatus** (Common Wart cress), *Geranium pusillum** (Small-flowered Cranes-bill), *Urtica urens** (Small Nettle), *Filago germanica** (Common Cudweed) and a number of garden escapes. Although much of the habitat was ephemeral in nature, it nevertheless gave a very interesting afternoon and opportunity to study several less well-known species.

The starred species above and the following are not recorded in the Plant Atlas for SE/67:

<i>Equisetum fluviatile</i>	<i>Sanguisorba officinalis</i>	<i>Hieracium pilosella</i>
<i>Raphanus raphanistrum</i>	<i>Cymbalaria muralis</i>	<i>Symphoricarpos rivularis</i>
<i>Cardaria draba</i>	<i>Sisymbrium officinale</i>	<i>Veronica persica</i>
<i>Bromus sterilis</i>	<i>Viola riviniana</i>	<i>Senecio viscosus</i>
<i>Arrhenatherum elatior</i>	<i>Sagina apetala</i>	<i>Tragopogon pratensis</i>
<i>Papaver lecoqii</i> (not recorded for SE/67 in the Critical Supplement to the Atlas).		

Bryology (M. DALBY)

In Hovingham High Wood the best records were *Dicranum strictum* on elders beside the path, *Plagiothecium curvifolium* found by Mr. Branson and *P. succulentum* found by Miss Robertson. A new plantation below the wood, where trenching had been carried out, produced such species as *Physcomitrium pyriforme*, *Bryum bornholmense*, *Pleurozium subulatum* and *Solenostoma crenulata*.

Wath quarry visited in the afternoon proved rather disappointing although *Aloina ambigua* was present in some quantity. Other species included *Riccardia pinguis*, *Barbula convoluta* and *Cratoneuron filicinum*.

My thanks to Mrs. J. Appleyard for identification of the *Bryum*.

Ornithology (A. J. WALLIS)

The morning period spent in the woodland area of High Hovingham Wood was of interest ornithologically in a comparison between those areas with tall mature timber with a thick undergrowth mainly of bramble and bracken and the cleared areas recently replanted with various species of conifer. In the mature woodland the tits, mainly Great Tits and Blue Tits, were numerous; Great-spotted Woodpeckers were about with many trees showing evidence of their nesting; Treecreepers had young, as had Redstarts, newly out of the nest; but the warblers were almost absent except for an occasional burst of song from a few Garden Warblers and Blackcaps.

The newly planted areas had both Willow Warblers and Chiffchaffs singing strongly, a family of Whitethroats, Tree Pipits using the nearby tall trees as song posts, and a Grasshopper Warbler which was watched by some as it "reeled" from the top of a young spruce.

The Wath Quarry had little to offer to the ornithologist other than a Partridge which feigned injury to draw attention away from its four newly hatched chicks, and a small colony of Sand Martins nesting in a soft bank pushed up by the human activity in the quarry. The woodland behind the quarry added only Tawny Owl to the list of woodland species seen during the day.

Comparing the list with the notes of the last visit to the area in 1935, Great-spotted Woodpecker replaces Green Woodpecker, and Collared Doves nesting in the village

were seen instead of Turtle Dove, which could have been expected but was not in the final list of 52 species for the day.

The full list is as follows, with (B) to indicate definite evidence of breeding noted. Kestrel (B), Partridge (B), Pheasant (B), Moorhen, Woodcock (B), Curlew (B), Wood-pigeon (B), Collared Dove (B), Cuckoo, Tawny Owl, Swift, Great-spotted Woodpecker (B), Skylark, Swallow, House Martin (B), Sand Martin (B), Carrion Crow, Rook, Jackdaw (B), Jay, Great Tit (B), Blue Tit (B), Coal Tit (B), Marsh Tit, Long-tailed Tit (B), Treecreeper (B), Wren (B), Song Thrush, Blackbird, Redstart (B), Robin (B), Grasshopper Warbler, Blackcap, Garden Warbler, Whitethroat (B), Willow Warbler (B), Chiffchaff, Goldcrest, Spotted Flycatcher (B), Dunnock, Tree Pipit (B), Pied Wagtail (B), Starling, Greenfinch, Goldfinch, Linnet (B), Redpoll (B), Bullfinch (B), Chaffinch, Yellowhammer, House Sparrow, Tree Sparrow.

Other Vertebrates (C. I. MASSEY)

Fishes handled were Bullhead and Stone Loach from a small stream below Hovingham High Wood and Bullhead only in Wath Beck. A single Common Frog seen in Kilscrew Wood was the only member of the herpetofauna found despite good conditions in what appeared to be favourable areas. Insectivorous mammals noted were Hedgehog, one dead on main road near Hovingham Quarry, Mole common throughout the area visited and Common Shrew, trapped on Mossburn Bank. Fox was scented in Hovingham High Wood and a Badger sett discovered in Wath Wood. Both Weasel and Stoat occurred on gamekeeper gibbets near Hovingham Spa and in Hovingham High Wood. Grey Squirrel was seen in Kilscrew Wood and several dead ones found in Hovingham High Wood where it was reported that over 400 had recently been shot. Two Brown Hare were seen in Hovingham High Wood and Rabbits were common throughout the area. Rodents proved difficult to find but Bank Vole and Wood Mouse were trapped on Mossburn Bank and traces of Water Vole were found along the banks of Wath Beck.

Entomology (J. H. FLINT)

After a dull start during the first hour, the weather rapidly improved and in places sheltered from the strong breeze conditions became excellent for entomology. The most productive habitats were the open rides in the mixed woodlands and there were plenty of insects and a good variety of species although nothing particularly uncommon was found. Conspicuous insects included the common scorpion-flies, *Panorpa communis* L. and *P. germanica* L., and many lacewings, including *Nathanica capitata* F. and *Chrysopa vittata* Wesm. The large bee-flies *Volucella bombylans* L. were quite common.

Lepidoptera were not specially sought, but in the first pasture that we entered there was an abundance of the Chimney Sweeper moth (*Odezia atrata* L.). Butterflies were not particularly plentiful and only common species were seen. A few moths were noted and Mrs. Draper found a colony of the larvae of the Mullein moth (*Cucullia verbasci* L.) on figwort (*Scrophularia nodosa*). It was very pleasing to see the couple of brilliant rubytail wasps (*Chrysis ignita* L.) which Mrs. Flint discovered sunning themselves on a fence post.

The only area worked away from the woodlands was a steep calcareous slope with a good covering of rockrose (*Helianthemum chamaecistus*) but the slope was exposed to the wind and this affected collecting. The only insects typical of such a habitat that could be found were the bug *Tinicephalus hortulanus* M.D. (an addition to the list for V.C. 62) and the tiny hopper *Eupteryx vittata* L.

Several members contributed to the full list of insects taken; a selection is given below. With the exception of the Mullein moth already mentioned, I am responsible for the determinations.

HEMIPTERA HETEROPTERA

Elasmucha grisea L.
Heterocordylus genistae Scop.
Liocoris tripustulatus F.

Orthops campestris L.
Calocoris quadripunctatus Vill.
C. alpestris M.-D.

HEMIPTERA HOMOPTERA

Cercopis vulnerata Ill.
Sonronius dahlbomi Zett.
Pseudotettix subfuscus Fall.

Cixius cunicularius L.
Ditropis pteridis Spin.
Dicranotropis hamata Boh.

LEPIDOPTERA

Dasychira pudibunda L. (Pale Tussock)
Bena prasinana L. (Green Silver-lines)
Episema coeruleocephala L. (Figure of Eight) (larvae)
Ectypa glyphica L. (Burnet Companion)
Semiothisa liturata Clerck (Tawny-Barred Angle)

COLEOPTERA

<i>Anthophagus caraboides</i> L.	<i>Alosterna tabacicolor</i> Deg.
<i>Podabrus alpinus</i> Pk.	<i>Clytus arietis</i> L.
<i>Malthinus flaveolus</i> Pk.	<i>Leiopus nebulosus</i> L.
<i>Malthodes mysticus</i> Kies.	<i>Polydrusus mollis</i> Str.
<i>Dasytes aerosus</i> Kies.	<i>P. cervinus</i> L.
<i>Aphideita oblitterata</i> L.	<i>P. tereticollis</i> Deg.
<i>Rhagium mordax</i> Deg.	

HYMENOPTERA SYMPHYTA

<i>Cephus cultratus</i> Evers.	<i>Strongylogaster lineata</i> Christ
<i>Strombocerus delicatulus</i> Fall.	<i>Rhogaster punctulata</i> Klug

HYMENOPTERA ACULEATA

Argogorytes mystaceus L.

DIPTERA

<i>Syrphus venustus</i> Meig.	<i>S. annulipes</i> Zett.
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Conchology (A. NORRIS)

The molluscan fauna of the areas visited around Hovingham proved to be rather a disappointment and only 25 species were recorded out of the 41 species known to occur in this 10 kilometre square.

None of those that were found are of any special interest and therefore only a list of species noted is given below:

<i>Potamopyrgus jenkinsi</i> (E. A. Smith)	<i>Monacha cantiana</i> (Mont.)
<i>Carychium minimum</i> Müll.	<i>Helicella caperata</i> (Mont.)
<i>Lymnaea peregra</i> (Müll.)	<i>H. virgata</i> (da Costa)
<i>Cochlicopa lubrica</i> (Müll.)	<i>Discus rotundatus</i> (Müll.)
<i>Lauria cylindracea</i> (da Costa)	<i>Arion intermedius</i> Normand
<i>Vallonia excentrica</i> Sterki	<i>A. circumscriptus</i> Johnston
<i>Clausilia bidentata</i> (Strom)	<i>A ater</i> agg.
<i>Arianta arbustorum</i> (L.)	<i>Oxychilus cellarius</i> Müll.
<i>Helix hortensis</i> (Müll.)	<i>O. alliarius</i> (Miller)
<i>H. aspersa</i> Müll.	<i>Retinella nitidula</i> (Drap.)
<i>Hygromia striolata</i> (C.Pfe.)	<i>Limax maximus</i> L.
<i>H. hispida</i> (L.)	<i>Agriolimax reticulatus</i> Müll.
	<i>A. laevis</i> (Müll.)

WEST BURTON for BISHOPDALE, V.C. 65 — 0th and —th July

Brilliant weather ensured a good turn-out for this weekend in Wensleydale. Saturday was spent on the western slopes of Bishopdale and on Sunday members drove up to Walden Head, from where they walked to the uppermost part of Waldendale.

The President, Mr. A. J. Wallis, presided at the tea and meeting for Reports at the Fox and Hounds Inn, West Burton on the Sunday, when warm thanks were expressed on behalf of the Union by Miss M. Taylor to all the landowners who had allowed us to wander freely over their property and particularly to Mr. and Mrs. Drake, of Longridge Farm, for their kind hospitality and to Mrs. J. Holloway for her work in organising and leading us during a most enjoyable weekend.

Landforms (C. SIMMS)

Three tributary dales of Wensleydale, trending rather south-west by north-east, are basically hay and sheep-country on generally calcareous thin soils overspread low in the valleys with slipped and possibly glacial material; many small exposures in gillsides show mixtures of grits and limestones.

The lesser gills are more accentuated by trees than the wider ones, but parts of Bishopdale particularly carry remnants of extensive late nineteenth-century planting which help to give an impression of what the medieval Bishopdale Chase might have been like. There are many old tree stumps, to considerable elevations. Waldendale,

evidently also once wooded, offers less shelter, with some more juvenile features at the crags and at landslips with clear backscars.

In Waldendale particularly, the main breaks-of-slope in the Yoredales series are not accentuated by enclosure-walls. In Waldendale the first break divides the inges below the farm from the first terrace at about 1,000 feet. Thin limestone here, cut by numerous sikes, sometimes outcrops about the limit of improved pasture at about 1000 feet, and in places shows signs of quarrying. The benches are rich in fescue grasses and have numerous swallow-holes for streams coming off the less permeable rocks above. Another line of limestone outcrops, obscured (on the north side especially) along the main dale by long hummocks, is at about 1350-1400 feet; but the main crags are at 1500 feet, marking the edge of the moorland proper. These crags are considerable and might reveal rock-shelters at their obscured bases, but nothing was found on this occasion.

Flowering Plants (W. A. SLEDGE)

Between 350-450 species are recorded in the *Atlas* from the 10 km. square in which Bishopdale lies. For an upland square with no arable cultivation this is a high number in view of the fact that very many extremely common species are not included. Even *Capsella*, *Erophila verna*, *Rubus fruticosus* and *Rumex acetosella* were, surprisingly, unrecorded and of the 170 species which I listed 34 were additional records though nearly all of these were common species.

On Saturday a small area about Rigg Beck and Foss Gill was investigated. The terrain covered included both wooded gills and open grass-moors, and both calcareous and non-calcareous soils were represented. The calcareous flushes yielded *Primula farinosa* (Mealy Primrose), *Triglochin palustre* (Marsh Arrow-grass), *Eleocharis quinqueflora* (Few-flowered Spike-rush), *Scirpus setaceus* (Bristle Scirpus), *Carex hostiana* (Tawny Sedge) and *Selaginella selaginoides* (Lesser Club-moss). On drier limestone rocks *Galium sternerii* (Limestone Bedstraw) and *Asplenium viride* (Green Spleenwort) were noted and in or about the gills *Crepis paludosa* (Marsh Hawksbeard), *Thelypteris limbosperma* (Mountain Fern) and *Equisetum telmateia* (Great Horsetail). Other species observed included *Geranium sylvaticum* (Wood Cranesbill), *Cirsium heterophyllum* (Melancholy Thistle), *Mimulus guttatus* (Monkey-flower), *Festuca arundinacea* (Tall Fescue) and *Polystichum aculeatum* (Hard Shield-fern).

Sunday's excursion to upper Waldendale lay partly in 34/98 but mainly in 34/97. The limestone rocks by the stream and the scars and open grass-moors above it were investigated under perfect weather conditions and provided much of interest. Throughout the length of the stream which we covered the New Zealand Willow-herb (*Epilobium nerterioides*) was abundant. *E. alsinifolium* (Chickweed Willow-herb) was also seen and in one boggy place plants intermediate between it and the *E. palustre* with which it grew were doubtless of hybrid origin. *Draba incana* (Hoary Whitlow-grass) was seen in several places and both this and the grass *Poa nemoralis* (Wood Poa) were additional records for the square 34/97. *Asplenium viride* and *Gymnocarpium robertianum* (Limestone Polypody) were plentiful on rocks by the stream.

A search was made for *Atcaea spicata* (Herb Christopher) which Mr. Stubbs recalled having seen in this valley 30 years ago. It was eventually found not far beyond our starting point and just within the 34/97 square though almost certainly not in the same locality as that in which Mr. Stubbs had previously found it. This Waldendale record constitutes an additional North Riding station for the species. Mr. Stubbs recorded *Vaccinium oxycoccus* (Cranberry) and *Saxifraga granulata* (Meadow Saxifrage) from higher ground than other members of the party reached (the former not recorded from this square) and also collected a specimen of *Minuartia verna* (Spring Sandwort). I did not keep a record of all plants observed in this square but at least six species were additional records to those marked in the *Atlas*.

Bryology (M. DALBY and F. E. BRANSON)

On a visit to Back Gill in 1922 C. A. Cheetham and W. H. Burrell described the gill as "to the bryologist a paradise, that could not be seriously dealt with in so short a time" — nevertheless they noted some 150 species! A visit there in 1971 produced the same feelings and the impossibility of doing justice to the site on one short visit. Limestone and siliceous boulders and cliffs, an unpolluted stream and a rich epiphyte population provided a variety of habitats. The most interesting species found was *Porella laevigata* growing on the exposed roots of an ash. Other species found included *Tetraxis browniana*, *Seligeria recurvata*, *Frullania tamarisci*, *Metzgeria pubescens*, *M. conjugata*, *Neckera crispa*, *Cololejeunea calcaria* and *Nowellia curvifolia*.

Unlike Back Gill visited the previous day, Waldendale was not at all bryologically rich in the number and quality of species. The valley was very open and exposed. In the middle of the valley was some marshy ground where there was *Climacium dendroides* and both *Philonotis fontana* and *P. calcarea* in fairly extensive patches. A runnel coming down the fairly steep side of the valley had quantities of *Hygrohypnum luridum* growing on rocks submerged in the water and a very little of the hepatic *Chiloscyphus polyanthos*. *Mnium affine* was also by this runnel. The only other "good" place noticed was a stone wall which was shaded by a few trees. Here were *Hypnum cupressiforme* var *resupinatum*, *Neckera complanata*, *Bryum capillare* and other common species. On the ground *Dichodontium pellucidum* was fairly frequent and some *D. pellucidum* var *flavescens* (a taller and more denticulate variety) on a rock by the stream. These are some of the chief constituents of the bryological flora of this dale, but on the whole Waldendale was a disappointing area.

Ornithology (A. C. M. DUNCAN)

Birds proved to be breeding in the area included Kestrel, Common Sandpiper, Swallow, Tree Pipit, Meadow Pipit, Yellow Wagtail, Dipper, Spotted Flycatcher, Whinchat, Blue and Great Tits and Nuthatch.

Birds singing were Wood Pigeon, Skylark, Wren, Willow Warbler, Robin, Blackbird, Song Thrush and Chaffinch.

Other birds seen were: Heron, Partridge, Pheasant, Lapwing, Curlew, Black-headed Gull, Swift, Sand Martin, House Martin, Grey Wagtail and Pied Wagtail, Dunnock, Garden Warbler, Wheatear, Redstart, Goldfinch, Redpoll, House Sparrow, Starling, Jackdaw, Rook and Carrion Crow. This made a total of 42 birds for the day.

On the Sunday we went up Waldendale, an offshoot of Bishopdale. The party proceeded by car to Walden Head from where the upper reaches of the dale were explored. 40 species of birds were seen in the day.

Red Grouse with 10 young and Starlings with nest were both proved breeding. Others seen included:

Short-eared Owl	Carrion Crow	Pied Wagtail
Merlin	Jackdaw	Meadow Pipit
Kestrel	Song Thrush	Skylark
Golden Plover	Ring Ouzel	Wren
Lapwing	Blackbird	Dipper
Dunlin	Mistle Thrush	Sand Martin
Sandpiper	Wheatear	House Martin
Snipe	Spotted Flycatcher	Blue Tit
Curlew	Chaffinch	Coal Tit
Black-headed Gull	Greenfinch	Linnet
Lesser Black-backed Gull	Willow Warbler	House Sparrow
Wood Pigeon	Yellow Wagtail	Tree Creeper
Stock Dove	Grey Wagtail	

Other Vertebrates (C. SIMMS)

I worked high Waldendale early on Saturday, Bishopdale near the main party on Saturday afternoon, and Waldendale north and south crags only, all Sunday. My notes therefore result mainly from close inspection of a few very limited areas in two extensive valleys, and they are supplemented by the observations of others — chiefly of road casualties. They cannot pretend to be more than a list of some of the fauna of the district.

Although conditions were ideal for their basking, no reptiles were recorded, and a Common Frog in Waldendale was the only amphibian noted. There was a marked scarcity of sight records of fish (only Brown Trout definitely established) and of mammals. Hedgehog and Mole were recorded as casualties; no shrews or bats were handled, but there was ample evidence of Fox and Badger in both dales and a Stoat was lured out of the north crags of Waldendale where a Weasel had been watched along a wall the previous day. Enquiries revealed no news of deer in either dale, but lagomorphs were seen, Rabbits at the crags and both Rabbits and Brown Hares elsewhere. No squirrels were seen but Mrs. Drake (who was most helpful) had seen Grey Squirrels in the older Bishopdale trees during the last six years. No trapping for small mammals was undertaken, but *Apodemus* was found about the crags and a Brown Rat was seen dead.

Entomology (J. H. FLINT)

Conditions, although quite different on the two days, were good for collecting. On Saturday the warm, moist air was conducive to insect activity and many were flying freely above the New House in Bishopdale. The open pasture produced the expected species and there were colonies of the grasshopper *Omocestus viridulus* L. A single example of *Tetrix undulata* Sow. was seen by Mr. Simms. At one point, at about 1,000 ft. contour, a small colony of solitary bees and wasps had colonised a limited exposure of rough, gritty sandstone soil and these (distinguished as B.1 in the lists below) were not found elsewhere during the weekend.

Caddisflies and stoneflies were plentiful in the vicinity of the streams on both days. They were not generally collected but two of the more distinctive were very active above and just below the top waterfall (B2) above the New House. It was here also that the rather thin population of upland streamside beetles and bugs was found.

Butterflies and moths were not particularly numerous on either day, the Small Heath (*Coenonympha pamphilus* L.) and the Common Blue (*Polyommatus icarus* Rott.) being the most common. A few Chimney Sweeper moths (*Odezia atrata* L.) were flying in the meadow below New House and a strong colony of the Grey Mountain Carpet* (*Entephria caesiata* Schiff.) on the rocky cliff below Deepdale Head on Sunday. The handsome mountain Bumblebee *Bombus lapponicus* F. was present in both dales but was particularly common in the upper parts of Waldendale and it was here that the dragonfly *Aeshna juncea* L. was hawking about the streams.

Of the insects certainly identified at the time of writing, the most notable was undoubtedly the montane hopper **Diplocolenus bensoni* China which was taken in Waldendale at an altitude of about 1,200 ft. This hopper has only previously been found in Yorkshire at altitudes above 2,000 ft. on Fountains Fell and 1,500 ft. on Penyghent.

Over a hundred species of insect were recorded. The selection listed below gives some indication of the insect life to be found but it also reflects the interests and collecting methods of the writer and Mrs. Flint. New vice-county records are indicated by an asterisk; B = Bishopdale, W = Waldendale.

HEMIPTERA HETEROPTERA

Orthops cervinus H.-S. (B)

Pithanus maerkeli H.-S. (B)

Saldula scotica Curt. (B2)

S. c-album Fieb. (B2)

HEMIPTERA HOMOPTERA

**Cixius cunicularius* L. (W)

**Javesella forcipata* Boh. (B)

LEPIDOPTERA

Colostyia pectinataria Knoch.

(Green Carpet) (W)

COLEOPTERA

Nebria glynnhali Schn. (B2)

N. brevicollis F. (B)

Notiophilus aquaticus L. (B)

Bembidion tibiale Duft. (B2)

B. atroviolaceum Duft. (B2)

Patrobis atrorufus Strm. (B)

Amara aulica Pz. (B)

Oreodytes rivalis Gyll. (W)

Dianous cuerulescens Gyll. (B2)

Staphylinus erythropterus L. (B)

Cantharis nigricans Muell. (B)

C. pallida Goetz. (B)

C. cryptica Ashe (B)

C. paludosa Fall. (B)

Hypnoidus riparius F.

Denticollis linearis L.

Gastrophysa viridula Deg.

Timarcha goettingensis L.

HYMENOPTERA SYMPHYTA

**Strongylogaster lineata* Christ (W)

**Aneugmenus padi* L. (B) (W)

Dolerus aericeps Thoms. (B) (W)

**Stethomostus fuliginosus* Schr. (B)

**Rhogogaster viridis* L. (B)

**Tenthredo livida* L. (B)

HYMENOPTERA ACULEATA

**Priocnemis minor* Zett. (B1)

**Crossocerus tarsatus* Schr. (B1)

Andrena jacobii Perk. (B1)

A. tarsata Nyl. (B1)

Nomada fabriciana L. (B1)

N. flavoguttata Kby. (B1)

Bombus agrorum F. (B) (W)

DIPTERA

Beris vallata Forst. (B)

Haematopota pluvialis L. (B) (W)

Plant Galls (F. B. STUBBS)

One gall only was recorded which appeared as blotches on Sycamore leaves. It was ascribed to *Eriophyes megalonyx*, a gall mite.

Notable absences included common species usually seen on Oak, Nettle, Thyme and Bracken although these plants occurred in abundance in most places.

Conchology (A. NORRIS)

Members of the Conchological Section were present on both days and five areas in three different ten kilometre squares were examined.

The first of the two days was spent examining the upper half of Bishopdale for its land mollusca with a quick visit over to Semer Water to record a few freshwater species. The most interesting record of the day was the locating of a single adult specimen of *Limax cinereoniger* Wolf deep in a crack in the rocks near to the waterfalls above Langrigg. (Grid Ref. 34/962835).

Sunday was spent mostly in the upper half of Walden Dale and up onto Walden Moor to a height of 1,750 feet above sea level. At this height very few species of mollusca could be located. Of the sixteen species that we recorded for upper Waldendale only eight of these reached a height of over 1,500 feet.

Our last few hours of the day were spent examining the area around Aysgarth Falls in the hope of locating one or two of the species recorded for that area in the past but which have not been confirmed in the last 20 or more years. In this we had only partial success, but we did locate one species, *Vertigo antivertigo* (Drap.), that had never been recorded for V.C. 65. I have also noticed that after checking the list of species vouchered for this vice-county that at least another four species recorded over the weekend had never been forwarded to the national recorded for the voucher collection.

		34/98		34/97	44/08
	B.	L.W.	S.	U.W.	A.
<i>Theodoxus fluviatilis</i> (L.)					A.
<i>Valvata cristata</i> Müller			S.		
<i>Potamopyrgus jenkinsi</i> (E. A. Smith)			S.		
<i>Carychium minimum</i> Müller		L.W.		U.W.	A.
<i>C. tridentatum</i> (Risso)		L.W.		U.W.	
<i>Lymnaea truncatula</i> (Müller)	B.	L.W.	S.	U.W.	A.
<i>L. palustris</i> (Müller)			S.		
<i>L. peregra</i> (Müller)			S.		A.
<i>Planorbis albus</i> Müller			S.		
<i>Acroloxus lacustris</i> (L.)			S.		
<i>Ancylus fluviatilis</i> Müller			S.	U.W.	A.
<i>Succinea pfeifferi</i> Rossm.	B.		S.		A.
<i>Cochlicopa lubrica</i> (Müller)	B.			U.W.	A.
<i>C. lubricella</i> (Stabile)	B.				
<i>Pyramidula rupestris</i> (Drap.)	B.			U.W.	A.
<i>Vertigo antivertigo</i> (Drap.)					A.
<i>V. pygmaea</i> (Drap.)	B.				A.
<i>Lauria cylindracea</i> (da Costa)	B.	L.W.		U.W.	A.
<i>Acanthinula aculeata</i> (Müller)					A.
<i>Vallonia pulchella</i> (Müller)					A.
<i>V. excentrica</i> Sterki	B.				A.
<i>Ena obscura</i> (Müller)	B.				A.
<i>Marpessa laminata</i> (Mont.)	B.				A.
<i>Clausilia bidentata</i> (Strom)	B.				A.
<i>Arianta arbustorum</i> (L.)	B.	L.W.			
<i>Helix nemoralis</i> (L.)	B.				
<i>Hygromia striolata</i> (C. Pfeiffer)	B.	L.W.		U.W.	A.
<i>H. hispida</i> (L.)	B.				
<i>Monacha granulata</i> (Alder)	B.	L.W.			A.
<i>Discus rotundatus</i> (Müller)	B.			U.W.	A.
<i>Arion intermedius</i> Normand	B.				A.
<i>A. circumscriptus</i> Johnston	B.	L.W.			A.
<i>A. hortensis</i> Ferussac	B.				
<i>A. subfuscus</i> (Drap.)	B.	L.W.			A.
<i>A. ater</i> agg.	B.	L.W.		U.W.	
<i>Euconulus fulvus</i> (Müller)	B.				A.
<i>Vitrea crystallina</i> (Müller)	B.	L.W.		U.W.	A.
<i>V. contracta</i> (Studer)	B.	L.W.		U.W.	A.
<i>Oxychilus cellarius</i> (Müller)	B.	L.W.		U.W.	A.
<i>O. alliarius</i> (Müller)	B.	L.W.			A.
<i>O. helveticus</i> (Blum.)	B.				A.

	34/98	S.	34/97	44/08
<i>Retinella radiatula</i> (Alder)	B.	L.W.	U.W.	A.
<i>R. pura</i> (Alder)	B.	L.W.	U.W.	A.
<i>R. nitidula</i> (Drap.)	B.			
<i>Zonitoides nitidus</i> (Müller)				A.
<i>Vitrina pellucida</i> (Müller)	B.	L.W.		
<i>Limax cinereoniger</i> Wolf	B.			
<i>Lehmannia marginata</i> (Müller)	B.	L.W.	U.W.	
<i>Agriolimax reticulatus</i> Müller	B.	L.W.	U.W.	A.
<i>A. laevis</i> (Müller)	B.			A.
<i>Anodonta anatina</i> (L.)		S.		
<i>Sphaerium corneum</i> (Say)		S.		
<i>Pisidium casertanum</i> (Poli)				A.

KEY TO LOCALITIES

34/98	B.	Bishopdale
	L.W.	Small area of woodland at Walden Head
	S.	Semer Water
34/97	U.W.	Upper Walden Dale (Walden Moor)
44/08	A.	Aysgarth Falls

HARDCASTLE CRAGS, V.C. 63 — 24th July

Wet weather hampered activities but over thirty members met in the car park of the Hebden Valley Nat. Trust Reserve and proceeded along the west bank of the river, examining it at various levels from the river side up to the wooded slopes. After about two miles we crossed to the east bank and returned to the car park. The thunderstorm and cloudburst which broke on us half way down the east bank prevented much exploration of the lime-based millstone grit. The meeting for tea and Reports was held at the White Lion Hotel, Hebden Bridge, when Mr. George Shaw took the Chair.

Mr. Spence of Todmorden expressed thanks on behalf of the Union to Mrs. Kemsley for planning and leading the meeting and to the Hebden Valley Reserve Committee for granting us access.

Lichens (P. M. EARLAND-BENNETT)

The lichen flora of Hardcastle Craggs and the Hebden Valley is comparatively rich and varied for a woodland in this part of Yorkshire. Although many species are depauperate, the total number and the frequency of some of the corticolous species indicate that this valley has suffered a little less from air-pollution than most others in this area. Of the small number of species (22) recorded from here in Lees (1888), Crump & Crossland (1904) and Watling (1968), six are almost certainly extinct and all but two of the other sixteen have been refound in plenty by the author. Examples of these are now housed in the Bankfield Museum Herbarium, Halifax.

At this meeting, thirty-four species were seen, a number of which are interesting due to their rarity in the area outside this woodland. Among these are *Lecanora lacustris* (With.) Nyl., *Peltigera polydactyla* (Neck.) Hoffm., *Lecidea lucida* (Ach.) Ach. and *Parmeliopsis ambigua* (Wulf.) Nyl., all of which are new records for this area. Lichens were found in all three major habitats, namely corticolous, saxicolous and terricolous/muscolous, some species occurring in more than one of these.

1. *Corticolous*. The western side of the valley consisted mainly of deciduous trees, especially *Quercus*, *Acer*, *Betula* and *Fagus*, while the eastern side consisted of both conifers and deciduous trees. The lichen flora became more abundant as we went higher up the valley, with all but one of the seven species seen, occurring on deciduous trees only.

Cetraria glauca (L.) Ach. — frequent on *Acer*, *Betula* and *Fagus*.

Lecanora conizaeoides Nyl. ex Cromb. — abundant on both conifers and deciduous trees, as well as on the bilberry and heather undergrowth.

Lepraria incana (L.) Ach. — common on boles of trees.

Mycoblastus sanguinarius (L.) Norm. — rare on *Fagus*.

Parmelia physodes (L.) Ach. — frequent on *Acer* and *Betula* (also seen on *Alnus glutinosa*).

P. saxatilis (L.) Ach. — frequent on *Acer*, *Betula* and *Fagus*.

Parmeliopsis ambigua (Wulf.) Nyl. — occasional on *Acer*.

2. *Saxicolous*. Hebden Valley is composed of almost horizontal strata belonging to the Millstone Grit Series, but there are few good exposures due to slipping. The upper part of the valley-sides are composed of the Lower Kinderscout Grit (Wray *et al.*, 1930) while the valley floor consists of the underlying Sabden Shales. Locally, both these series are calcareous (Lloyd & Stephens, 1927).

The saxicolous flora was mainly confined to the acid gritstone rocks, the latter occurring as outcrops, loose boulders (especially in Hebden Water) and as wall-rocks. The only calcicolous lichens seen were on the mortar of the few buildings along the route taken. Of the twenty-two species seen, seventeen were on the acid rocks and five on mortar.

Baeomyces rufus (Huds.) Rebent. — frequent on damp acid rocks, especially by Hebden Water.

Caloplaca citrina (Hoffm.) Th. Fr. — occasional on mortar.

C. holocarpa (Hoffm.) Wade — rare on mortar.

Candelariella vitellina (Hoffm.) Müll. Arg. — occasional on mortar.

Cetraria glauca (L.) Ach. — common on acid wall-rocks and boulders, especially in and by Hebden Water.

Cornicularia aculeata (Schreb.) Ach. — rare on acid boulders.

Lecania erysibe (Ach.) Mudd — occasional on mortar.

Lecanora conizaeoides Nyl. ex Cromb. — abundant on acid wall-rocks, outcrops and boulders.

L. dispersa (Pers.) Sommerf. — occasional on mortar.

L. intricata var. *soralifera* Suza — occasional on acid wall-rocks.

L. lacustris (With.) Nyl. — aquatic species on acid rocks. Rare and only known in this area from near Gibson's Mill.

Lecidea albocaulerulescens (Wulf.) Ach. — occasional on acid wall-rocks.

L. lucida (Ach.) Ach. — rare between wall-rocks of Gibson's Mill.

L. macrocarpa (DC.) Steud. — frequent on acid rocks, especially by Hebden Water.

L. tumida Massal. — locally frequent, depauperate and usually on exposed gritstone boulders.

Lepraria incana (L.) Ach. — abundant on any damp, shaded, acid rocks or walls.

Mycoblastus sanguinari (L.) Norm. — occasional on acid wall-rocks and outcrops. Always sterile.

Ochrolechia androgyna (Hoffm.) Arnold — frequent on acid boulders and outcrops.

Parmelia conspersa (Ehrh. ex Ach.) Ach. — occasional on acid gritstone outcrops and boulders.

P. furfuracea var. *ceratea* (Ach.) D. Hawksw. — rare on acid wall-rocks.

P. physodes (L.) Ach. — frequent on acid boulders, outcrops and wall-rocks.

P. saxatilis (L.) Ach. — common on acid rocks.

3. *Terricolous-Muscicolous*. I have included under this habitat, sandy and peaty soil, humus and decaying vegetation, rotting logs and mosses (on the ground, rocks and trees). The lichen flora in these habitats was abundant and widespread, although only twelve species were seen.

Cladonia chlorophaea (Flörke ex Sommerf.) Spreng. — occasional on humus.

C. coccifera (L.) Willd. — frequent on soil, especially on acid rock.

C. digitata (L.) Hoffm. — occasional on moss on the ground.

C. fimbriata (L.) Fr. — occasional on soil on walls.

C. floerkeana (Fr.) Sommerf. — rare on soil on acid rocks.

C. macilenta Hoffm. — common in most habitats.

C. polydactyla (Flörke) Spreng. — abundant in all habitats.

C. squamosa (Scop.) Hoffm. — frequent on soil and moss, particularly over rock.

Lecidea granulosa (Hoffm.) Ach. — common on peaty soils, humus, rotting vegetation, logs, etc.

L. uliginosa (Schr.) Ach. — occasional on rotting vegetation.

Lepraria incana (L.) Ach. — frequent on soil between wall-rocks.

Peltigera polydactyla (Neck.) Hoffm. — rare on moss on rotting log, a single specimen being the only one known in this area.

Nomenclature follows P. W. James, 1965, *A New Check-List of British Lichens* and 1966, *Additions and Corrections* — 1.

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Vascular Plants (F. MURGATROYD)

The first plant of interest was seen from the car park at the meeting place; several large specimens of *Osmunda regalis* (Royal fern) were pointed out growing in an almost inaccessible situation on the river side.

The botanists' route was by way of the path on the south side of the river from New Bridge to Hebden Hey, then along the top of the wood returning to the river level at Gibson Mill. The woodland at first was of a heathy birchwood type with *Calluna* dominant in the shrub layer and with many very large plants of *Vaccinium myrtillus* (Hilberry). Near the river side in a very wet area where the dominant plant was *Equisetum sylvaticum* (Wood Horsetail), *Dactylorhiza fuchsii* was plentiful along with *Crepis peltodora* (Marsh Hawksbeard), *Epilobium obscurum* (Willow Herb) and *Carex laevigata* (Smooth-stalked Sedge). *Impatiens glandulifera* (Balsam) was very much in evidence near the river and in damp places generally.

Ascending to the top of the wood at Hebden Hey and continuing north-westwards, some fine colonies of *Thelypteris phegopteris* (Beech Fern) were seen growing on a damp slope. Arriving at Gibson Mill bridge, the small colony of *Erinus alpinus* which has been known there for many years, was seen, along with the ferns *Polypodium vulgare* (Common Polypody) and *Asplenium ruta-muraria* (Wall Rue).

Beyond the top dam where the Sabden Shales were exposed, *Fragaria vesca* (Wild Strawberry) grew in some quantity on both sides of the river and on a rock face a few plants of *Polystichum aculeatum* (Prickly Shield Fern) were noted. Near Walshaw Bridge *Chrysosplenium oppositifolium* (Golden Saxifrage) was searched for and found though in only small quantity. At Hell Holes, a little further north *Lycopodium clavatum* (Common Club Moss) was sought for unsuccessfully.

On the way back on the opposite side of the river, a calcareous grit outcrop was examined. The most interesting plant here was *Asplenium trichomanes* (Maidenhair Spleenwort) but *Melica nutans* (Mountain Melick) previously known here, was not found on this occasion. On a gravelly stretch of ground near the roadside a number of small plants of *Gnaphalium sylvaticum* (Wood Cudweed) were found, a species not previously recorded for Hebden Valley. *Convallaria majalis* (Lily of the Valley) was well established on a bank, though this had possibly been introduced.

Between Gibson Mill and the lodge, many of the species found in damp woods and on stream-sides were seen. The garden wall at the lodge yielded among other ferns *Cystopteris fragilis* (Brittle Bladder Fern) and *Phyllitis scolopendrium* (Hart's Tongue). In the garden were some fine plants of *Osmunda regalis* (Royal Fern).

Ornithology (J. D. PICKUP)

Thirty-six species of birds were recorded. Woodland on both sides of Hebden Water was visited and some members went as far as the open country in the upper reaches of the valley. The heavy showers did not make observation easy. In one down-pour a dipper was seen sheltering underneath a Rhododendron bush. Adult and juvenile Great Tit, Blue Tit and Coal Tit were seen. Redpolls were numerous throughout the woodland. There were good views of male and female Redstarts by the dam above Gibson's Mill. A Turtle Dove was heard calling near the mill; an unusual occurrence so high up a Pennine valley and unlikely to indicate the presence of a breeding bird. Young and adult Pied Wagtails were seen but strangely no record of Grey Wagtail, a known resident of the valley.

Blackcap, Whitethroat, Willow Warblers and Goldcrests were seen and heard. Twite were found in the upper reaches of the valley above the woodland.

The list included the following: Lesser Black-backed Gull, Black-headed Gull, Woodpigeon, Turtle Dove, Swift, Swallow, House Martin, Jay, Great Tit, Blue Tit, Coal Tit, Treecreeper, Wren, Dipper, Mistle Thrush, Song Thrush, Blackbird, Redstart, Robin, Blackcap, Whitethroat, Willow Warbler, Goldcrest, Spotted Flycatcher, Dunnock, Meadow Pipit, Tree Pipit, Pied Wagtail, Starling, Linnet, Twite, Redpoll, Bullfinch, Chaffinch, House Sparrow and Tree Sparrow.

OTHER VERTEBRATES

Common Frog and a small unidentified Newt were seen, also Rabbit and Red Squirrel.

LEPIDOPTERA

Pieris napi (Green-veined White)

Coenonympha pamphilus (Small Heath)

Euphyia bilineata (Yellow Shell)

were recorded by members during the day.

Conchology (A. NORRIS)

Three members of the Conchological Section were present, and although the molluscan fauna of the two 10 km. squares visited was poor the day proved to be most interesting. The lower part of the valley, in square 34/92, produced a total of 20 species. This compares fairly well with the list of species recorded from this area by the conchological members present at a Y.N.U. meeting held in the same area in 1904 when they recorded a total of 21 species.

The full list of species recorded is as follows:

	34/92	34/93
<i>Potamopyrgus jenkinsi</i> (E. A. Smith)	O	O
<i>Carychium minimum</i> Müller	O	O
<i>Lymnaea truncatula</i> (Müller)	—	O
<i>L. peregra</i> (Müller)	O	—
<i>Ancylus fluviatilis</i> Müller	O	—
<i>Cochlicopa lubrica</i> (Müller)	O	—
<i>C. lubricella</i> (Strabile)	O	—
<i>Punctum pygmaeum</i> (Drap.)	—	O
<i>Discus rotundatus</i> (Müller)	O	O
<i>Arion intermedius</i> Normand	O	—
<i>A. circumscriptus</i> Johnston	—	O
<i>A. hortensis</i> Ferussac	O	O
<i>A. subfuscus</i> (Drap.)	O	O
<i>A. ater</i> agg.	O	O
<i>Euconulus fulvus</i> (Müller)	O	O
<i>Vitrea crystallina</i> (Müller)	O	O
<i>Oxychilus alliarius</i> (Müller)	O	O
<i>Retinella radiatula</i> (Alder)	O	O
<i>R. pura</i> (Alder)	O	—
<i>R. nitidula</i> (Drap.)	O	—
<i>Vitrina pellucida</i> (Müller)	O	—
<i>Lehmannia marginata</i> (Müller)	O	—
<i>Agriolimax reticulatus</i> Müller	O	—
<i>A. laevis</i> (Müller)	—	O
<i>Pisidium personatum</i> Malm.	—	O

Physical Science for Biologists by J. A. Edgington and H. J. Sherman. Pp. xii + 225 with 37 text figures and 14 tables. Hutchinson University Library. Hardback £1.80: paperback 80p.

This is a text aimed at first year biology students with little prior knowledge of either physics or mathematics and exemplifies the growing realisation among the many, recognised for a long time by few, of a need for both by the professional biologist. It is based upon the authors' experience in teaching biology students in the University of London. Although a worthy attempt it falls between two stools; it will fail to impress the more knowledgeable because the treatment is throughout sketchy and sometimes trivial and will confuse the less physically able both by its almost telegraphic style and because the biological examples are mostly forced and sometimes in error. To the professional the contents are relevant, though the authors have missed the opportunity of restating some topics (e.g. osmosis) in a way more relevant to biology, but the areas of physics not covered — e.g. electrostatics and electromagnetics — will occasion some surprise in view of current developing interests. However, this book is very good value for money for students in need of an introductory text which will lead them into further reading.

R.D.P.

AUTUMN FUNGUS FORAY LEEDS, SEPTEMBER 4-7th, 1970

W. G. BRAMLEY

Once again the Mycological Section was favoured by the weather and in spite of the previous warm and dry summer, fungi were not at all scarce. It was also heartening to see many members of the local society turn out and take an interest in the toadstools.

Roundhay Park got us off to a good start, giving hope that the somewhat meagre collections of the past few years would be bettered, and this proved eventually to be the case. One or two seeming young puffballs turned out to be exceedingly hard and had no doubt strayed from the adjoining golf course, whilst only a few yards further away a couple of grey squirrels chasing about amongst the feet of mycologists added to the enjoyment.

Bramham Park was perhaps not as productive as in the past, but some twenty fungus hunters certainly exceeded the numbers usually present.

Usually Saw Woods can be reckoned on to provide plenty of material but on this occasion little was to be found by most of the party. The ground was very dry but one or two early arrivals kept more to the lower part and did much better. After some cross country riding a brief glimpse into Rough Hay Wood did not look promising and the remaining part of the afternoon was spent in Harewood Park. Another visit to a different area of the Park by the remaining members of the party on Monday morning terminated another enjoyable foray.

The recorder tenders his thanks to all who helped to collect, and especially to those who sent in records. The long list of agarics is mostly the work of Dr. R. Watling and P. Orton. It was a pleasure to some of the older members to have the latter once again on a Yorkshire foray. In spite of the many samples of dung taken back to Scotland pressure of other work in the agricultural field prevented Mr. M. Richardson from giving them the attention they usually get from him.

The following list includes the more noteworthy records. Several are not on the Yorkshire list or have very few records.

B = Bramham Park

H1 = Harewood Park entrance at Wyke Road

H2 = Harewood Park entrance at Alwoodley Gates

R = Roundhay Park

S = Saw Woods

DISCOMYCETES (W.G.B. & M.R.)

Catinella olivacea, on wet rotten *Fagus*, H1.

Helotium laetum, on wet rotten *Betula*, S.

Pustularia catinus, H1.

AGARICALES (R.W. & P.D.O.) Authors according to 1960 Check List.

Amanita citrina, R.

A. inornata, H2.

Boletus porosporus (Imler) Watling,

B.R.

B. reticulatus, R.

Conocybe ochracea, H2.

C. pilosella, B.

C. pseudopilosella, H1, H2.

C. subovalis, H1, H2.

Coprinus acuminatus, R, S.

C. cinereus, H2.

C. hiascens sensu J. Lange, H1, R.

C. urticicola, B.

C. xanthothrix, H1.

Deconica coprophila, R.

Galerina nana, R.

G. clavata, H1.

Gomphidius rutilus, B.

Hebeloma saccariolens, R.

H. sinapizans, R.

Hygrophorus chrysaspis, B.

Inocybe jurana, R.

I. praetervisa, B.

I. pusio, R.

Laccaria bicolor, R.

L. proxima, R.

Lactarius chrysorhaeus, R.

L. cisticarius, B.

L. fluens, S.

L. insulsus, B.

L. pterosporus, B.

L. pubescens, B, R.

Lepiota mastoidea, B.

L. pseudo-helveola, B.

Leptonia atromarginata.

L. babingtonii, H1.

L. griseocyanea, B.

L. incana, B.

L. serrulata, B.

Lyophyllum connatum, R.

Marasmius calopus, B.

Melanoleuca excissa, B.

Panaeolus subbalteatus, H2.

Pleurotellus acerosus, R.

Pluteus lutescens, B.
Psathyrella candolleana, B.
P. pseudogracilis, B.
P. squamosa, R.
Russula betularum, R.
R. caerulea, B.
R. claroflava, R.
R. farinipes, R.

R. foetens, B, S.
R. lutea, B.
R. luteotacta, B.
R. pulchella, R.
R. subfoetens, S.
R. velenovskyi, R, S.
R. vesca.
Volvariella pubescentipes, B.

GASTEROMYCETES (R.W.)

Phallus impudicus var. *indusiata*, H.2.

BRYOLOGICAL EXCURSION TO WASS BANK, V.C. 62,
 17th APRIL 1971

F. E. BRANSON

There is woodland on both sides of the road up Wass Bank, that on the right being planted mostly with conifers, but that on the left is more of a natural kind of mixed woodland. We first went along a ride through a plantation on the right of the road. On the left of the path were some calcareous cliffs which had an interesting flora of such lime-loving species as *Tortella tortuosa*, *Barbula cylindrica*, *Neckera crispa*, *N. complanata*, *Anomodon viticulosus*, *Rhynchostegiella tenella*, *Ctenidium molluscum*, *Leiocolea turbinata* etc. On the side of this ride Mr. E. Thompson found a small patch of *Campylopus introflexus* — the second record of this moss for V.C. 62. Later we crossed over to the left of the road and collected in the more natural part. In a sheltered gully filled with rocks and fallen trees were *Nowellia curvifolia* and a small amount of *Dicranum strictum*. A small runnel in the bottom of the valley produced a few of the species usually found in such habitats, viz.: *Hygrohypnum luridum*, *Cratoneuron filicinum*, *Eurhynchium riparioides* etc. Miss Dalby had *Tetraphis browniana* from sandstone rocks and I collected *Tortula marginata*. Although occurring somewhat sparsely about Knaresborough I do not recollect finding this species anywhere else. Most of the party had collected some *Seligeria*s from the limestone cliffs. These are always difficult to identify, but have been determined by Mr. R. D. Fitzgerald as *S. acutifolia* var. *longiseta*. The list of species (excluding those mentioned above) is given below.

MUSCI:

Atrichum undulatum
Polytrichum formosum
Fissidens minutulus var. *tenuifolius*
F. taxifolius
F. bryoides
Ceratodon purpureus var. *purpureus*
Seligeria recurvata
Dicranella heteromalla
Dicranoweisia cirrata c.fr.
Dicranum scoparium
Encalypta streptocarpa
Tortula muralis c.fr.
Barbula rigidula
Trichostomum crispulum
Grimmia apocarpa c.fr.
G. pulvinata c.fr.
Funaria hygrometrica c.fr.
Tetraphis pellucida
Orthodontium lineare c.fr.
Pohlia nutans c.fr.
Bryum caespitium
B. capillare c.fr.
Mnium hornum
M. undulatum
M. punctatum
Omalia trichomanoides
Thamnum alopecurum
Thuidium tamariscinum

Cratoneuron commutatum var.
commutatum
Amblystegium serpens
Acrocladium cuspidatum
Camptothecium sericeum
Brachythecium rutabulum
B. rivulare
B. velutinum c.fr.
B. populeum
Cirriphyllum piliferum
C. crassinervium
Eurhynchium striatum
E. praelongum
E. murale c.fr.
E. confertum
Pseudoscleropodium purum
Pleurozium schreberi
Isopterygium elegans
Plagiothecium denticulatum
P. curvifolium
P. succulentum
P. sylvaticum
Hypnum cupressiforme and var.
resupinatum
H. lindbergii
Rhytidiadelphus squarrosus
Hylacomium splendens

HEPATICAEE:

Conocephalum conicum
Pellia epiphylla
Metzgeria furcata
Lepidozia reptans
Calypogeia muelleriana
Lophozia ventricosa
Solenostoma triste
S. crenulatum

Plagiochila asplenoides var.
asplenoides
Lophocolea bidentata
L. cuspidata
L. heterophylla
Cephalozia bicuspidata
Diplophyllum albicans

VERTEBRATE SECTION FIELD MEETING

HOWSHAM WOOD, V.C. 61, 4th JULY 1971

This was the first field meeting of the section, to demonstrate live-trapping techniques for small mammals and to introduce members to the projects being carried out there by the Yorkshire Mammal Group, who have a field hut in the wood (by permission of the Forestry Commission and the landowner) and have long-term observations current.

Mr. N. C. Cowx, Chairman, was in charge of the meeting which assembled at St. John's College, York in fine but humid weather. The following attended: Mesdames E. Hazelwood, F. Huddleston, J. G. Lambert, Lloyd-Evans, Middleton, Stone and Walsh, Messrs. D. L. Aspinall, D. S. C. Brierly, J. T. Dealtry, Lloyd-Evans, J. Middleton, C. Pilling, C. Simms and M. J. A. Thompson.

Traps laid in a variety of woodland biotopes the previous evening were lifted in turn and methods of siting, laying and baiting were described. Back at the field hut opening of traps, handling, sexing, weighing and measuring and parasite-seeking were demonstrated, and several took the opportunities for photography, often with exploratory *Apodemus* in curious positions about their persons. The following species had been trapped: *Sorex araneus*, *S. minutus*, *Apodemus sylvaticus*, *Clethrionomys glareolus* and *Microtus agrestis*.

Common Toads *Bufo bufo*, and damage of *Sciurus carolinensis*, were seen about the hut. Field sign of *Erinaceus europaeus*, *Talpa europea*, *Vulpes vulpes*, *Meles meles* and *Oryctolagus cuniculus* were found additionally by E. H. and C. S., and the latter had noted scent of *Mustela nivalis* on the previous day.

Those who could remain for the early part of the evening proceeded to the biology laboratories at St. John's College for further demonstrations and a useful discussion of recording techniques using grid map overlays. Flat and round museum skins, skeletal material and wet preparations, and a critical comparison of various English and American designs of live-traps were conducted by N.C., but time did not allow demonstration of staining and parasitological techniques. There was discussion of the present day status of the lesser-known small rodents in Yorkshire. C.S.

ENTOMOLOGICAL SECTION FIELD MEETING

BECKHEAD WOOD, 16th MAY 1971

Seven members and friends attended this field meeting at the request of the Management Committee of the Beckhead Wood Reserve. The weather was dull and cool at first but the sun came out later and brought some insects up. After about an hour and a half it was decided that the area was not going to prove very productive and we moved on to Burdale. Mr. J. H. Flint comments as follows: "Only a superficial search was made for ground fauna and that was almost completely unproductive. There is no reason to think that the Reserve has any great attraction for such insects, only the rove-beetle *Stenus similis* Hbst., typical of dry situations being noted. Sawflies were not plentiful but were the most noticeable group seen and collected. They may have wandered on to the Reserve from adjacent fields and woods and this seems the most likely explanation for the occurrence of *Anoplonyx destructor* Bens. whose larva feeds on larch."

The following list has been supplied by Mr. Flint, together with notes on food plants where indicated.

COLEOPTERA

Stenus similis Hbst.*Byturus tomentosus* Deg.*Phyllodecta vitellinae* L. (Salix spp.)

HYMENOPTERA: SYMPHYTA

Dolerus liogaster Thoms. (Gramineae)*D. gonager* F. (Gramineae)*D. haematodes* Schrk. (Gramineae and Cyperaceae)*D. aeneus* Hart. (Gramineae)*D. sanguinicollis* Klug* *Monophadnoides puncticeps* Kon. (*Poterium sanguisorba*) A common sp.*Aglaostigma aucupariae* Klug (*Galium boreale* and *G. mollugo*)*A. fulvipes* Scop. (*Galium mollugo* and *G. verum*)* *Anoplonyx destructor* Bens. (*Larix*)† *Nematus umbratus* Thoms. (*Betula*, also *Ulmus*, *Corylus*, *Alnus*)

Local and scarce throughout Britain.

HEMIPTERA HOMOPTERA

Ulopa reticulata F.

My own list which follows calls for little comment. With the exception of *Neoscias aenea* Mg. all are exceedingly common insects. *N. aenea* will in time no doubt prove to be widespread but it is a member of a genus which has suffered badly from changes in nomenclature and all earlier records under this name are ignored as far as Yorkshire is concerned.

HEMIPTERA HETEROPTERA

Tingis ampliata (Herrich, Schaeffer)*Anthocoris nemorum* (L.)*Dicyphus stachidis* Reut.*Lygus rugulipennis* Popp.*Liocoris tripustulatus* (Fab.)

† New to Yorkshire

* New to Vice-County 61

DIPTERA

Melanostoma scalare Fab.*Platychirus albimanus* Fab.*Syrphus venustus* Mg.* *Neoscias aenea* Mg.

R.C.

Holden Clough; the natural history of a small Lancashire valley. Scientific editors **L. N. Kidd** and **M. G. Fitton**. Pp. 199 with 60 illustrations. Oldham Public Libraries, Art Gallery and Museum, 1971. 50p.

Holden Clough, a small, steep-sided valley little more than a mile long, is a nature reserve in an area dominated by housing and industry just south of Oldham. It has attracted the attention of local naturalists for many years and since 1955 systematic records have been kept of the flora and fauna. Investigation has covered many aspects of the land form and wild life and the results are now published in this handsome account. The local people have been helped by specialists who have visited the Clough or identified material. All concerned are to be congratulated, not least the members of the Oldham Public Libraries, Art Gallery and Museums Committee who have backed this effort.

The Clough is typical of many such narrow valleys on the lower slopes of the Pennines. It is not particularly rich in species but this account reveals the great diversity of life to be found in such a restricted area. The lists of flowering plants and birds may well be exhaustive. Other sections reveal the disparity of treatment inevitable in such a survey as this and the editors hope that others will aspire to fill the gaps for publication in a supplement. The scope of the work may be judged by the extent to which orders have been worked; 39 molluscs, 88 spiders, 62 crane-flies and 83 rove-beetles are listed, to select examples from orders that are not often well covered by local societies. In most orders one can spot absences of forms that one would have expected to be present and to have been found, as, for example, in the case of the ground-beetles where the almost ubiquitous *Calathus melanocephalus* is not among the 32 species listed.

But this is not simply a list of species. There is a very readable introduction to each section and to each order. There is informed comment, sometimes original, against almost every species mentioned. The illustrations, line drawings, photographs and decorative figures alike, are all highly commendable. All local naturalists, and surely a great many local people who would not call themselves naturalists, will treasure this, and many outside the area too. Not a few will wish that their own local reserves could obtain such handsome treatment.

J.H.F.

BOOK REVIEWS

The Naturalists' Yorkshire edited by W. A. Sledge, compiled by members of the Yorkshire Naturalists' Union. Pp. 96, with 21 black and white photographs. Dalesman Publishing Company Ltd., 1971. 60p.

This long-awaited book gives a picture of contemporary Yorkshire for naturalists and by naturalists. It is the ideal introduction to the natural history of the county and as such will serve visitor and resident very well indeed. Each section is the work of a county authority backed by more than a century of Union records. The Union itself, its role and achievements, come over very well and rightly so, for this is the organisation which everyone interested in the natural history of Yorkshire should support. Reviewing a book of this type requires a non-specialist in a sense and, since this is my role in respect of most of the contents, I have attempted to be objective in this, whilst retaining my subjective involvement with the Union and its work.

Apart from editing the volume, W. A. Sledge was responsible for the section on flowering plants and ferns. It must be taken as a mark of good editing that the style of each section keeps its individuality but harmonises with the others. H. C. Versey's chapter on geology and topography is literally the rock on which the other sections rest and like the botanical section offers a clear, readily comprehended, account ideal for the non-specialist (i.e. the reviewer). The faunal sections offer the authors some unenviable tasks, but these they cope with magnificently. J. H. Flint summarises the insects by picking out the highlights of various habitats, putting them against the background of their respective ecologies and distribution patterns. For Malham Tarn to share the Caddis-fly, *Agrypnetes crassicornis* with Finland, the Caucasus and North-west Mongolia is the sort of remarkable fact that is bound to stimulate the reader's imagination and prompt him to look for the underlying factors of distribution. In this chapter more than any other, Yorkshire comes across as a meeting ground for northern and southern animals.

John Armitage deals with conchology, and restricts himself to some land and freshwater forms, in a section which aims at rousing the interest of the reader in these rather neglected groups. His delight at the discovery of the slug, *Arion lusitanicus* in an environment of sacking, bricks and wet cardboard is infectious and is enough to send anyone out on a voyage of discovery in the sea of dereliction which surrounds our cities.

Freshwater and marine fishes are the provinces of J. H. Elliott and D. E. Whittaker respectively. The former has a relatively short species list to deal with but they form a group with enormous difficulties in recording. Pollution tends to shorten the list further and anglers re-stocking programmes to alter or even obliterate distribution patterns. David Whittaker also deals with fishermen a good deal and has proved a master at abstracting biological information from their nets and trawls. The tantalising references which he makes to marine invertebrates make one realise how sad an omission they are from the present work.

Mammals are dealt with by Ellen Hazelwood and almost the full county list qualify for a mention. They are generally thought of as a "Cinderella" group but must lose this tag to freshwater fishes or reptiles and amphibians on the coverage given. The two last-mentioned get only a minute mention at the end of the mammal section.

Birds I have left until last for this is the group most in popular demand. R. F. Dickens had the unenviable task of squeezing them into fifteen pages and his essay can not be praised too highly. His ecological treatment was the only possible solution under the circumstances and even so he finds space to give a short history of bird protection in Yorkshire as well as a plea for more observations from neglected areas.

Summing up this work is difficult — with this degree of compression some shortcomings are inevitable. High on the list of these is the lack of a decent map or even maps. Lists of the breeding birds and mammals would surely have been possible. They would also have allowed the convention of using scientific names to run right through the book. A list of addresses of relevant organisations would also have been useful. With the interests of Yorkshire natural history still very much at heart, and in continuing membership of the YNU, I hope that I can still count the authors as friends.

To the Dalesman Publishing Company one must offer praise for their production. From the quality of paper to the binding this is a robust work — as is fitting. A lot of copies are going to be much-thumbed, annotated and underlined between the Pennine tops and the sands of Spurn in the near future.

T.M.C.

Conservation of Nature by **Eric Duffey**. Pp. 128. Collins. £1.50.

Decade of Decision, edited by **P. H. G. Hettena** and **G. N. Syer** being a report on The Conservation Society's Conference "Conservation 1970's", published by Academic Press Inc., London for The Conservation Society. Pp. 128. Price not stated.

Do you understand the difference between conservation and preservation? Are you worried about the disappearance of species you once were sure you could find? Is it sufficient to establish nature reserves and know that no further changes are possible under wise management? Will the Wolds, the Moors, the Dales have any wild places left for the naturalist in, say, a hundred years' time? If you are ill at ease in answering these questions, then the two books under review may have something to say to you.

Dr. Eric Duffey, a professional conservationist with an international reputation in various ecological fields, has written an excellent introductory book on nature conservation. Chapters dealing with Man, his farming and forestry techniques, water and life, population, pollution, pesticides, and nature conservation are packed with innumerable examples presented in a readable style — though one is often disappointed that space did not permit the author to give a fuller and more critical appraisal of many of the experiments he describes. Well over a hundred colour illustrations are fully captioned and provide an attractive additional source of information. This book can be warmly recommended as an introduction to worldwide concepts and problems in the conservation of nature, particularly as it is so attractive to look at and so authoritatively written.

The other book under review starts where Eric Duffey's book leaves off. It is almost entirely concerned with the interpretation and implication of the facts he describes, resolving itself into an assessment of the proper balance between short-term economic gain and long-term survival, between moral codes and business expediency. The conference which is reported set out to make "people more aware of the effects on the environment of the unwise use of technology and of the population explosion". *Decade of Decision* suffers from being a verbatim report on a conference; it contains a lot of irrelevant material, it is scrappy, and it is a report of the spoken rather than the written word. Despite these limitations, there is sufficient challenge in its message to make us all consider once more what our attitude should be, not only to nature conservation but also the conservation of the total environment. In many ways the last chapter, now published separately as a pamphlet entitled "Why Britain needs a Conservation Policy for the Environment" will fully justify any naturalist in acquiring a copy of this book. The Conservation Society adds a dimension to the problem which the naturalist is liable to ignore, and for this reason we welcome their publications.

C.J.S.

The Threat of World Pollution by **Kenneth Mellanby**. Pp. 16. (The Essex Hall Lecture for 1971). The Lindsey Press. 20p.

Environment, Resources, Pollution and Society edited by **W. M. Murdock**, being a symposium of chapters contributed by the editor and 19 other authors. Pp. 440 with line diagrams, bibliographies for each chapter, notes on authors, index, soft back. 1971. Sinauer Associates Inc., U.S.A. Price not stated.

It is to be hoped that it is a sign of the times that the literature of biological conservation written by scientists is being published in quantity. Accordingly these two, very different, books are to be welcomed.

From England, Dr. Mellanby speaks with his usual moderation and at times with cautious optimism (though he only gives us 30 years to solve the population problem). Reprints of lectures often do not read well but this is an exception and well worth the 20p.

From America, this scientific study of the environment merits a fuller evaluation than is possible here. Well documented, it seeks to base an approach to our environmental problems on a scientific, objective and unemotional study of the complex relationships between Man and The Earth; but with the realization that in turn this must be translated into economic and political action. Suitable for University students whose courses are concerned with conservation or resource management, it begins with an introduction to ecological systems, followed by three sections: Population and Resources, Environmental degradation, environment and Society. It is good to note that the authors are not guilty of developing another branch of jargon, because this is a realm of endeavour where specialist and layman need open channels of communication. Inevitably some parts are of particular relevance to America, and one would like to see some of our own problems used as the basis of another such text.

D.H.A.

The Compleat Naturalist: A Life of Linnaeus by Wilfrid Blunt. Pp. 256 with 32 colour plates and over 150 monochrome illustrations. Collins. £3.50.

Deus creavit; Linnaeus disposuit. The aphorism was current during Linnaeus' lifetime. It would certainly be known to him and there is little doubt that he accepted it as a plain statement of fact and in Mr. Blunt's words "saw the confusion that he had inherited and warmly congratulated himself on the successful completion of a half-finished job". For none had a higher opinion of Linnaeus than Linnaeus. He not only blew his own trumpet, he blew it *fortissimo*. Yet for all his "almost unbelievable self-satisfaction with his own achievements" he was an engaging character; his less admirable traits were far more than offset by the warmth of his character, his genius for making friends and converts, his prodigious industry and gift for methodical organization and the immense impetus he gave to biological investigations apart from his own contributions to science. His lecture courses and field excursions at Uppsala became famous far beyond his own country for he had the great teacher's capacity to fire his students with his own boundless enthusiasm for his subject. More than a score of his pupils became Professors and many of the celebrated biologists in the latter part of the eighteenth century learnt their science from him.

Linnaeus was a colourful figure and this lively biography does full justice to its subject. His childhood and early years; his Lapland journey and later journeys to other parts of Sweden; his years abroad in Germany, Holland and England; his family life and his career following his return to Sweden, are all described with a combination of vigour and discernment which make it hard to put the book down. Inevitably too one learns much about other contemporary biologists since so many of the famous botanists and zoologists of his time were either closely associated with or at least came into contact with Linnaeus. There is also an appendix on Linnaean classification, nomenclature and method contributed by the authoritative pen of Dr. W. T. Stearn.

As one would expect from Wilfrid Blunt the selection of illustrations has been treated with the same critical judgement as the preparation of the text. Their admirable reproduction and the handsome format of the book make this a work which is well worth its price and one which will surely remain the standard English biography of one of the greatest and most justly celebrated of all figures in natural history.

W.A.S.

The Oxford Book of Invertebrates by David Nichols and John A. L. Cooke illustrated by Derek Whiteley. Pp. viii + 218 including 96 colour plates. Oxford Univ. Press, 1971. £3.

This delightful book admirably succeeds in its avowed purpose, namely "to direct the attention of naturalists and students to the profusion of invertebrate wild life that surrounds them". Not only does it reveal something of the almost incredible diversity of invertebrate life but also its beauty, for here are portrayed in splendid colour, sponges and jellyfishes, sea anemones, slugs and scallops, cuttlefishes, centipedes, prawns and spiders, and a host of other representatives of this fantastic assemblage of organisms. Only the insects, on which there is a separate volume in the same series, are omitted. The animals, mostly members of the British fauna, are illustrated in basically taxonomic groups according to habit or habitat, and concise descriptions include appropriate notes on habits, life histories and other attributes. There is also a useful outline classification of invertebrates and a glossary. It is admitted that an ideal classification still eludes us, thus disarming critics who would, for instance, include the Onychophora among the arthropods or who abhor the use of the grade Mandibulata as a taxon. The classification of the Malacostraca is misleading.

Most of the plates are excellent, those of the larger soft-bodied or shell-bearing forms being better than those of microscopic arthropods whose delineation demands a more meticulous technique if accuracy — with which beauty is inseparably linked — is to be achieved.

As not even a trio of minds can have a comprehensive grasp of this vast assemblage, errors are inevitable. Thus the notostracan *Lepidurus* masquerades as *Triops* and neither artist nor author can be familiar with the commensal oligochaete *Chaetogaster linnaea*, a minute creature bearing little or no resemblance to the anonymous worm depicted, nor can they have seen the ctenopod cladoceran *Holopedium* in its gelatinous case or the exquisite beauty of an expanded colony of the polyzoan *Cristatella*, and the artist clearly did not understand the anatomy of the minute crustaceans that he drew. The text is occasionally at fault, as in the use of antennule, or misleadingly precise, as when defining hosts of certain parasites, but it would be grossly unfair to emphasise these deficiencies in an otherwise excellent, well-produced book.

G.F.

The Nature of Life: Earth, Plants, Animals, Man and their effect on each other, by **Lorus and Margery Milne**. Pp. 320 with 208 illustrations including 82 in full colour. Cassell, London. £5.50.

The authors' object is to give a global account of life on earth. To attempt this in fourteen chapters is a formidable undertaking, yet the result is a notable achievement. The treatment is regionally organised into accounts of old world and new world tropics, temperate Eurasia and N. America, northern circumpolar regions, Australia and New Guinea, New Zealand and the Pacific, isolated islands, the open seas, sea coasts and sea floors, and life in brackish and fresh waters. These are preceded by chapters on evolution and problems of dispersal and geographical distribution, and followed by one on the rise and spread of man and the biological results of his activities.

The authors' first-hand experience of travel in all the continents and to many of the remoter parts of the world qualifies them for their task and within the available space limits these chapters are very well done. As professional zoologists one might expect them to deal more competently with animals yet a good balance has been struck between animals and plants and their survey never degenerates into a mere chronicle of facts but the reader's interest is sharpened by discussions of interrelationships and problems of distribution, and the influence of recent and ancient changes in environment and their effects on patterns of life and distribution. The book is enhanced by the splendid series of illustrations; all are of a very high standard and those in colour are outstandingly beautiful. But a perusal of the text quickly dispels any suspicion that the pictures are the chief attraction of this book. They complement the high quality and competence of a handsomely produced and informative work the scientific interest and soundness of which is matched by its skilful and attractive presentation.

W.A.S.

Mammals in Colour by **Leif Lyneborg**. Illustrated by **Henning Anthon**, translated and adapted by **Gwynne Vevers** and **Winwood Reade**. Pp. 247 with 148 colour illustrations, 90 distribution maps, plus 7 text figs. Blandford Press. £1.75.

This is just the book of European mammals for which we have waited for so long! The 148 species are beautifully illustrated and occupy the first 90 pages. Attention has been paid to detail and the additional sketches included of footprints, teeth, damage, deer rumps, etc. are most helpful in identification of the species; for each species the head and body, and tail lengths are given. The colour is good.

The latter part of the book gives an introduction to each order followed by an account of the identification, distribution, habitat and habits of each species within the order. The text is detailed and interesting to read. There is a short but useful bibliography and the index is by English or scientific names.

The book is full of all kinds of information and is a most useful reference and guide to the mammals of Britain and Europe at a bargain price.

E.H.

Come Wind, Come Weather. A Biography of **Alfred Howitt** by **Mary Howitt Walker**. Pp. xii + 348, with 11 plates and 2 maps. Melbourne University Press: agents, International Scholarly Book Services Inc., London. £4.35.

Born in Nottingham in 1830, to the distinguished writers **William** and **Mary Howitt**, **Alfred Howitt** with his father and younger brother sailed for the gold rushes in Victoria, Australia in 1852. He spent the rest of his 78 years there and by his distinction as a bushman, explorer, geologist, anthropologist, naturalist, magistrate and public servant, he was an eminent Victorian in both senses of the word. The separation of **Alfred** from his parents and sisters who remained in Europe resulted in 55 years of correspondence; a correspondence which contributes substantially to this fascinating and most readable biography by his granddaughter.

Howitt's successful search in 1861 for the doomed **Burke** and **Wills** expedition by itself assures him of a place in Australian history. However at the age of 38, this self-taught geologist started organised scientific study. An initiated member of the **Kurnai Tribe**, he pioneered techniques which took anthropology out of the armchair and into the field. His research on aboriginal customs, primitive religion and the organisation of primitive society put him in the front rank of the science. His place in the scientific pantheon is separately assessed in chapters by geologist **J. Talent** and prehistorian **D. Mulvaney**. As a botanist, I would like to know more of his botanical work. Brief snippets give hints of an ecological approach to botany perhaps far in advance of his time. A serious fault of the book is the quite inadequate maps, and readers will need a very good Australian Atlas by their side.

L.D.I.

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 1971 .. ELLIOTT, Mrs. G., M.Sc., 20 Hempland Lane, York YO3 0AX (B.).
 1960 .. ELLIS, E. W., Gedham, Ossett (O.).
 1967 .. ELSWORTHY, G. D., 14 Greenbank Avenue, Maghull, Liverpool (O.).
 1959 .. ENGLAND, Miss M., 46 St. Helena Road, Bradford 6 (O.).
 1971 .. EVISON, R., 34 Frogmire Road, Knaresborough (E., M., O.).
- 1964 .. FAIRCLOUGH, R. J., 58 Wetherby Road, Harrogate (O.).
 1964 A. FAIRCLOUGH, Mrs. F., 58 Wetherby Road, Harrogate.
 1962 .. FAIRHURST, Miss JOAN, High Close, Lands Lane, Knaresborough (O.).
 1966 .. FARMER, BRIAN, Lime Trees, The Boyle, Barwick in Elmet, Leeds (O.).
 1969 .. FAULKNER, P. A., 22 Fountain Road, Northallerton.
 1921 .. FEARNLEY, W. F., Foyle, Kings Road, Ilkley (O.).
 1968 .. FEATHER, K. P., Lumb Ghyll, Crosshills, Nr. Keighley (Z.).
 1955 .. FENTON, J. K., Moor Cottage, Woodhead, Burley-in-Wharfedale, Ilkley (O.).
 1953 .. FENTON, K., 17 Mill Walk, Snuff Mill Lane, Cottingham, E. Yorks. (O.).
 1933 .. FENTON, Col. Sir WILLIAM, M.C., J.P., Fieldhead, Cleckheaton.
 1933 A. FENTON, Lady, Fieldhead, Cleckheaton.
 1965 .. FEWSTER, S. W., 8 Gledhow Lane, Leeds 8 (E., B., O.).
 1967 .. FIELD, J. H., B.Sc., 34 Wells Green Road, Sheldon, Solihull, Warwickshire (Br.).
 1967 .. FARNDON, Mrs. L. C., 141 Rayleigh Drive, Woodlands Park, Wideopen, Northumberland (O., Z.).
- 1969 .. FISON, T. W., M.R.C.V.S., Hawthorn Bungalow, Clifford, Boston Spa (O., Z.).
 1967 .. FITZGERALD, F., 5 Alwoodley Lane, Leeds 17.
 1967 .. FITZGERALD, Mrs. B., 5 Alwoodley Lane, Leeds 17.
 1968 .. FITZGERALD, Miss JEAN, 2A Linnet Lane, Liverpool 17.
 1968 .. FLEMING, J., Farm Cottage, Rockwood, Gargrave Road, Skipton (O., Z.).
 1940 .. FLINT, J. H., 7 Norfolk Mount, Leeds 7 (E.).
 1946 A. FLINT, Mrs. HILDA E., 7 Norfolk Mount, Leeds 7 (E.).
 1964 .. FLINT, P. W. H., 7 Norfolk Mount, Leeds 7 (E.).
 1956 .. FORD, T. H., 39 Ashbury Drive, Sheffield S8 8LE.
 1943 L. FORGES, GRAHAM DES, Prospect Cottage, Balcombe, Sussex.
 1961 .. FORSTER, Dr. J., 106 New Adel Lane, Leeds 16 (O.).
 1969 .. FOSTER, R., 11 The Cranbrooks, Wheldrake, York (E.).
 1968 .. FOTHERBY, D. I., 21 Auckland Avenue, Hull (B., Z.).
 1961 .. FOX, Dr. B. W., Tryfan, Longlands Road, New Mills, Stockport, Cheshire (B., Br., E.).
 1971 .. FOX, B. W., B.Sc., 7 Cutiepurse Lane, Richmond, Yorks. (O.).
 1970 .. FRISBY, Mrs. B. I., Wren Hill, 40 Hawksworth Road, Horsforth, Leeds (E.).
 1964 .. FRUDD, A., 87 South Parade, Ossett (O.).
 1949 .. FRYER, G., Elleray Cottage, Windermere, Westmorland (F.).
- 1958 .. GARDAM, Miss P., 17 Knowsley Avenue, Cottingham, E. Yorks. (B.).
 1959 .. GARFORTH, Mrs. D., Cedarwood, 61 Wigfield Drive, Ward Green, Barnsley (O.).
 1965 .. GARSED, K., Hullen Edge Hall, Elland, Yorks.
 1971 .. GILBERT, G., B.Sc., 14 Rose Avenue, Marsh, Huddersfield HD3 4BL (B., O.).
 1971 A. GILBERT, Mrs. PATRICIA D., 14 Rose Avenue, Marsh, Huddersfield HD3 4BL.
 1961 .. GILPIN, A., F.R.P.S., 1 Claremont Villas, Clarendon Road, Leeds 2 (O.).
 1957 .. GORDON, Dr. G. D., Burnt Yates Bar, Clint, Ripley, Harrogate.
 1963 .. GORWITS, M., 541 King Lane, Leeds 17 (O.).
 1958 .. GOSDEN, Mrs. M. S., 92 Ring Road, West Park, Leeds 16.
 1964 .. GOW, Mrs. W. M., Bamford Edge, Bamford, via Sheffield (Br.).
 1958 .. GOWLAND, Miss A. M., 678 Beverley High Road, Hull.
 1966 .. GRACE, E., Thorn House, Jackson Lane, Thornhill, Dewsbury (O.).
 1951 .. GRACE, J., 27 Fir Avenue, Ravensthorpe, Dewsbury.
 1954 .. GRADDON, W. D., B.Sc., 3 Blake Avenue, Merrivale, Ross on Wye, Herefordshire (M.).
 1961 .. GRAHAM, Rev. G. G., B.A., The Vicarage, Hunwick, Crook, Co. Durham (B., Br.).
 1961 L. GRAHAM, M. W. R. DE V., D.Phil. (Oxon.), Hope Dept., University Museum, Oxford (E.).
 1924 .. GRAINGER, J., B.Sc., Ph.D., White Gables, St. Quivox, by Ayr (M.).
 1922 A. GRAINGER, Mrs. J., B.Sc., White Gables, St. Quivox, by Ayr.

Yorkshire Naturalists' Union: List of Members, 1971

- 1969 .. GRANT, D. R., B.Sc., "Highlands", 7 Owlcotes Lane, Pudsey (B.).
 1948 .. GRAVETT, P. L., 67 East Ella Drive, Anlaby Road, Hull.
 1970 .. GRAY, Mrs. M., 45 Aberdeen Terrace, Clayton, Bradford (O.).
 1960 .. GREEN, H. S., Westfield House, Bradley, Keighley (O.).
 1960 A. GREEN, Mrs. H. S., Westfield House, Bradley, Keighley.
 1967 .. GREENHALGH, M. E., 35 Moss Lea, Tarleton, Nr. Preston, Lancs.
 1951 .. GREENWOOD, A. D., B.Sc., Botany Dept., Imperial College, Prince Consort Road, London S.W.7 (B., M.).
 1966 .. GREGORY, M. G., The Pines, 11 Wetherby Road, Knaresborough (O.).
 1971 A. GRIFFITH, IAN, 23 The Quarry, Alwoodley, Leeds 17.
 1964 .. GRIFFITH, J. S., L.D.S., F.Z.S., Strathmore, Conisbro', Doncaster (O.).
 1947 .. GRIFFITH, F. C., Strathmore, 3 Park Drive, Sprotbro', Doncaster
 1964 .. GUNNINGHAM, Miss FRED A., 52 Cross Green, Otley.
 1955 .. HAGUE, J. B., A.Weld.I., M.B.O.U., Lubbecke Primary School, BFPO 22, Germany.
 1963 .. HANCOCK, Mrs. MARY, 7 Park Terrace, New Earswick, York.
 1969 .. HARCOURT, R. B., F.R.C.S., 43 Park Square, Leeds 1 (O.).
 1958 .. HARDCASTLE, K., 12 The Bank, Leeming, Oxenhope, Keighley (O.).
 1964 .. HARNETT, Mrs. V. M., 17 Congreve Approach, Bardsey, Nr. Leeds (E., O.).
 1963 .. HARRIS, Miss E. J., Flat 1, Elmfield House, 63 South Street, Cottingham, E. Yorks.
 1966 .. HARRIS, R., The Nook, 74 Bradford Road, Menston, Ilkley (E.).
 1958 .. HARRISON, D. L., M.A., M.B., B.Ch., F.Z.S., Bowerwood House, St. Botolph's Road, Sevenoaks, Kent (Z.).
 1969 .. HARRISON, N., 199 Ingrow Lane, Keighley (B., O.).
 1969 A. HARRISON, Mrs., 199 Ingrow Lane, Keighley.
 1908 .. HARROGATE PUBLIC LIBRARY, Victoria Avenue, Harrogate.
 1970 .. HARRISON, F., 24 Church Street, Holloway, Nr. Matlock, Derbyshire.
 1965 .. HARTLEY, J. W., 43 Lundhill Road, Wombwell, Barnsley (O.).
 1942 .. HARTLEY, J. D., Lynton Avenue, Boston Spa.
 1968 .. HARTLEY, Miss M. M., B.Sc., Assistant Keeper, Natural History, Cartwright Hall, Lister Park, Bradford 9.
 1967 .. HARTLEY, C., 26 Hazel Crescent, Chickenley, Nr. Dewsbury (B., M.).
 1958 A. HARTLEY, Miss MARIE, Coleshouse, Askrigg, Leyburn.
 1967 .. HARWOOD, R. H., 17 West View Court, Yeadon, Nr. Leeds (O.).
 1950 .. HAXBY, C. R., 4 Windermere Terrace, Bradford 7 (E.).
 1969 .. HAYDON, R. G., 9 Swanland Hill, N. Ferriby, E. Yorks.
 1958 .. HAYTHORNTHWAITHE, Mrs. W. G., Low Garth, Arkendale, Knaresborough (B.).
 1935 .. HAZELWOOD, Mrs. E., Oak Mount, 44 Rigby Lane, Bradshaw, Nr. Bolton, Lancs. (Z.).
 1970 .. HENSON, Dr. R. M., 8 Westcliffe Terrace, Harrogate (B.).
 1970 A. HENSON, Mrs. ANGELA, 8 Westcliffe Terrace, Harrogate.
 1949 .. HENSON, H., D.Sc., F.R.E.S., 24 Elmete Avenue, Leeds 8 (E.).
 1960 .. HERING, T. F., M.A., Ph.D., Department of Agricultural Science, University of Nottingham School of Agriculture, Sutton Bonington, Loughborough (M.).
 1967 .. HERRINGSHAW, D., 64 Butterthwaite Road, Sheffield S5 0AU (B., E., O.).
 1959 .. HERON, Dr. A. M. R., George-a-Green, Lupset, Wakefield (E.).
 1965 .. HESSEWOOD, J., 19 Laburnum Avenue, Garden Village, Hull
 1964 .. HICKSON, J. R., Westfield, Nether Yeadon, Nr. Leeds.
 1952 .. HILLAS, D. K., Swanland House, Swanland, N. Ferriby, E. Yorks. (O.).
 1971 .. HIND, J. D., 5 Edgerton Road, Leeds LS16 5JD (O.).
 1969 .. HIRD, D., B.Mus., F.R.C.O., 58 Deighton Lane, Batley (O.).
 1964 .. HIRST, W. R., 33 Longley Lane, Longley, Huddersfield (O.).
 1959 .. HOBSON, G. R., 52 New Road, Yeadon, Nr. Leeds (B., O.).
 1970 .. HOCKING, Miss M. A., B.Sc., White Lodge, North Hill Road, Leeds LS6 2EN (O.).
 1961 .. HOCKLEY, F., 13 Playfair Terrace, Leeds 10 (B., O.).
 1969 .. HODGSON, M. G., 1 Driffield Road, Molescroft, Beverley (O.).
 1960 .. HOLDROYD, E. J., Turnstones, Honley, Huddersfield (O.).
 1931 .. HOLLIS, Mrs. LINDSAY M., 48 Denton Avenue, Leeds 8 (M.).
 1963 A. HOLLIS, E. D., 48 Denton Avenue, Leeds 8.
 1963 .. HOLLIS, E. S., 2 Ashfield Road, Birkby, Huddersfield.
 1963 A. HOLLIS, Mrs. VERA, 2 Ashfield Road, Birkby, Huddersfield.
 1962 .. HOLLOWAY, Mrs. JEAN M., 54 Gilling Road, Richmond, Yorks. (B.).
 1957 .. HORN, Mrs. K. M., Beechtrees, 17 Gilling Road, Richmond, Yorks.
 1958 .. HOUGHTON, H. J., 7 Willingham Road, Lea, Gainsborough, Lincs.
 1955 .. HOUSEMAN, Mrs. F., 152 Weston Drive, Otley LS21 2DJ (B.).
 1960 A. HOUSEMAN, R. B., 152 Weston Drive, Otley LS21 2DJ.
 1959 L. HOWARD, Mrs. T. H., c/o 87 Thorpe Lea Road, Egham, Surrey (nee Dearing).
 1962 .. HOWE, G. B., 34 Hartley Avenue, Leeds 6 (O.).
 1969 .. HOWES, C. A., M.B.O.U., c/o Doncaster Museum, Chequer Road, Doncaster (O., Z.).
 1964 .. HUBBARD, L., 1 Alexandra Road West, Longwood, Huddersfield (O.).
 1967 .. HUDDLESTONE, Miss F., Kildare Bungalow, Baghill Lane, Pontefract (M., Z.).
 1936 .. HUGHES, D. R., B.Sc., F.G.S., 90 Maidavale Crescent, Coventry (G.).
 1970 .. HUGO, P. D. J., 38 Cotswold Crescent, Chipping Norton, Oxon. OX7 5DT.
 1962 .. HULL MUNICIPAL MUSEUMS, 23-24 High Street, Hull.
 1965 .. HUMBLE, P. A., "Craigmere", Southfield Road, Burley-in-Wharfedale, Ilkley (B.).
 1965 A. HUMBLE, Mrs., "Craigmere", Southfield Road, Burley-in-Wharfedale, Ilkley.
 1949 .. HUNT, C. W., B.Sc., 2 Highland Avenue, Hanwell, London W.7.
 1961 .. HURCOMB, The Rt. Hon. Lord, 47 Campden Hill Court, London W.8.
 1963 .. ILLMAN, O., B.Sc., M.I.Biol., 134 Baslow Road, Totley, Sheffield (E., O.).
 1952 .. IMRIE, Miss J. P., 19 West Bank Road, Skipton (B.).
 1958 .. INGILBY, Miss JOAN A., Coleshouse, Askrigg, Leyburn.
 1964 .. IRELAND, J. G., 212 Lowerhouses Lane, Longley, Huddersfield (O.).

Yorkshire Naturalists' Union: List of Members, 1971

- 1964 .. JACKSON, R. V., c/o Midland Bank, 77 Street Lane, Leeds 8 (O.).
1955 .. JACKSON, E. E., The Wildfowl Trust, Slimbridge, Glos. (O., Z.).
1964 .. JACKSON, H. W., Market Place, Masham, Ripon (O.).
1969 .. JACKSON, B., 3 Smithy Lane, Burley-in-Wharfedale, Ilkley (O.).
1960 .. JACKSON, S. M., 22 Armoury Road, Selby (E.).
1964 .. JAMES, H. T., B.A., 238 Sigston Road, Beverley (O.).
1945 .. JESPER, D. M., 23 Woodlands Grove, Harrogate (E.).
1968 .. JOHNSON, Mrs. D., Oakerbank Farm, Skipton Road, Killinghall, Nr. Harrogate.
1966 .. JOHNSON, J. H., 1 Berry Street, Hephthorne Lane, Chesterfield (E.).
1970 .. JONES, Miss H. M., 1 Lacey Street, Horbury, Wakefield (B.).
1960 .. JOSEPHS, A. P., 10 Heathfield Close, Villa Road, Bingley (O.).
- 1957 .. KAY, M. S., The Garden House, Caley Park, Pool-in-Wharfedale, Otley.
1967 .. KEMSLEY, Mrs. FREDA K., 36 Partridge Flatt Road, Bessacarr, Doncaster.
1967 A. KEMSLEY, J., 36 Partridge Flatt Road, Bessacarr, Doncaster.
1950 .. KENNINGTON, F. E., Lodge Farm, Benningholme Lane, Skirlaugh, Nr. Hull (O.).
1964 .. KENYON, J. S., 56 Estcourt Avenue, Leeds 6 (O.).
1947 .. KILBY, Miss RUTH, Elmhurst, Lynton Avenue, Boston Spa (B.).
1956 A. KILBY, Miss M. B., Elmhurst, Lynton Avenue, Boston Spa.
1951 .. KILBY, B. A., M.A., Ph.D., F.R.I.C., Dept. of Biochemistry, 9 Hyde Terrace, Leeds 2 (B.).
1971 .. King, C. E., 168 Chain Lane, Bradford BD1 2DU (B., O.).
1945 .. KITCHEN, Rev. T. B., Skirlaw, Roundham Gardens, Paignton, Devon (E.).
1954 A. KITCHEN, Mrs. T. B., Skirlaw, Roundham Gardens, Paignton, Devon.
1968 .. KNIGHT, J. E., 76 Thames Avenue, Guisborough (O., Z.).
1954 .. KNIGHT, W. J., Gwelfor, 4 Menai Villas, Menai Bridge, Anglesey.
1962 .. KNOTT, Miss M. A., 9 Belmont Street, Wakefield (O.).
- 1971 .. LAMBERT, Miss J., 110 Clifton, York (B.).
1965 .. LANDE, Miss V. M. VAN DER, Zoology Dept., University, Nottingham.
1951 .. LA TOUCHE, C. J. P., M.Sc., L.A.H., Dept. of Bacteriology, School of Medicine, University, Leeds LS2 9JT (M.).
- 1970 .. LASSEY, P. A., B.Sc., 6 Catherine Slack, Hove Edge, Brighouse, Yorks. HD6 2LL.
1958 .. LAWRENCE, I. C., 57 The Oval, Brookfield, Middlesbrough (B.).
1953 .. LAWTON, F., 20 Fawcett Crescent, Woodley, Reading, Berks.
1960 .. LEACH, J. H. I., 6 Oakdale Drive, Wrose, Shipley (O.).
1960 A. LEACH, Mrs. M., 6 Oakdale Drive, Wrose, Shipley.
1960 A. LEACH, Miss A. M., 6 Oakdale Drive, Wrose, Shipley.
1971 .. LEAN, G. K., The Manor House, Brearton, Nr. Harrogate.
1971 A. LEAN, Mrs., The Manor House, Brearton, Nr. Harrogate.
1971 .. LEDWOOD, J. S., B.Sc., 184 Park Avenue, Hull (B., M.).
1955 .. LEE, A. H. B., 12 Adel Towers Court, Long Causeway, Leeds 16 (O.).
1966 A. LEE, Mrs. GILLIAN, 12 Adel Towers Court, Long Causeway, Leeds 16.
1957 .. LEE, Miss Marian, Bracken Lodge, Park Drive, Eldwick, Bingley (B.).
1966 .. LEE, J. A., 30 Springfield Road, Gatley, Cheshire (B., O.).
1947 .. LEEFE, R. A., Sarcroft, Langton Road, Norton, Malton.
1962 .. LEES, C., Lower Willow Hall, Sowerby Bridge, Yorks.
1962 .. LEFFVRE, Miss H., B.Sc., Beckside, Linton, Skipton (B.).
1929 .. LEICESTER MUSEUM AND ART GALLERY, New Walk, Leicester.
1964 .. LEONARD, D. H., 8 Brownberrie Walk, Horsforth, Nr Leeds (O.).
1906 .. LIBRARY OF COMMERCE, SCIENCE AND TECHNOLOGY, Central Library, Leeds 1.
1971 .. LIGHTOWLER, D. M., 9 Roundhill Avenue, Cottingham, Bingley, Yorks.
1969 .. LIMBERT, G., 57 Queens Park Drive, Airedale, Castleford (O.).
1965 .. LINDHOLM, Herr Bo, Hjo Mekaniska Verkstad, Hjo, Sweden (O.).
1968 .. LITTLE, E. R. B., M.A., F.L.S., 6 Jellicoe House, Compass Road, Hull (Br.).
1971 .. LITTLETON, E. W., 261 Bradford Road, Batley, Yorks.
1969 .. LLOYD-EVANS, L., M.B., Ch.B., 22 Belgreave Avenue, New Mill, Huddersfield HD7 7DP.
1969 .. LLOYD-EVANS, Mrs. M. M., 22 Belgreave Avenue, New Mill, Huddersfield HD7 7DP.
1956 .. LONSDALE, Miss B., 24 Fernbank Drive, Baildon, Shipley (O.).
1954 .. LORD, Miss G. W., 12 Ramshill Road, Scarborough (M.).
1940 .. LORD, J., M.Sc., Orduna, 155 Tamworth Road, Sutton Coldfield (O.).
1943 .. LOVETT, M., B.Sc., 206 Bradford Road, Wakefield (F.).
1958 .. LOVIS, J. D., B.Sc., Ph.D., Botany Dept., University, Leeds LS2 9JT (B., M.).
1966 .. LUCAS, E., 16 Birchen Avenue, Ossett, Yorks. (B.).
1964 .. LUCAS, G. V., 22 Wharfedale Crescent, New Lane, Skelmanthorpe (O.).
1963 L. LUCAS, B., 8 Cambourne Drive, Fixby, Huddersfield HD2 2NF.
1963 .. LUCAS, Mrs. M. J., 8 Cambourne Drive, Fixby Huddersfield HD2 2NF.
1969 .. LUMLEY, J. W., 83 Wensley Road, Leeds LS7 2LS (O.).
1963 .. LUSH, R. L. G., 32 Matthews Green Road, Wokingham, Berks.
- 1963 .. MACKERNES, Miss I. L., 5 Castle Drive, Hood Green, Stainborough, Nr. Barnsley (Br.).
1956 .. MAGEE, L., 4 Park Square, Parklands, Pool-in-Wharfedale, Otley (B., O.).
1948 .. MALHAM TARN FIELD CENTRE, via Settle, Yorks.
1961 .. MALLINSON, D., 12 Heights Drive, Gillroyd Lane, Linthwaite, Huddersfield (O.).
1949 .. MARJORAM, H., 106 Bolling Road, Ben Rhydding, Ilkley (O.).
1967 .. MARJORAM, Mrs. D., B.Sc., 106 Bolling Road, Ben Rhydding, Ilkley.
1968 .. MARSDEN, C., B.Sc., Ph.D., "Burnside", Low Bradfield, Sheffield (B., E., O.).
1954 .. MARTIN, S., Garlies, The Park, Swanland, N. Ferryby, E. Yorks. (O.).
1964 L. MARTIN, J. I., 12 Nether Avenue, Grenoside, Nr. Sheffield (O.).
1945 .. MASON, E. W., M.A., Yew Tree Cottage, Sudbrook Lane, Petersham, Surrey (M.).
1945 A. MASON, Mrs. U., Yew Tree Cottage, Sudbrook Lane, Petersham, Surrey.
1963 .. MASON, A. F. B., 41 Spring Gardens, Anlaby Common, Hull.
1968 .. MASSEY, C. I., 4 Chantry Road, E. Aytton, Scarborough.
1962 .. MATHER, J. R., M.B.O.U., 44 Aspin Lane, Knaresborough (O.).

Yorkshire Naturalists' Union: List of Members, 1971

- 1959 .. MAYALL, K. M., 26 Grosvenor Avenue, Pontefract.
 1966 .. MCHALE, Mrs. I. H., 7 Hanover Road, Scarborough.
 1954 .. MEDD, T. F., 53 Bootham Crescent, York (B.).
 1958 A. MEDD, Mrs. T. F., 53 Botham Crescent, York.
 1947 .. MENDHAM, N. V., B.Sc., 2 Flounders Hill, Ackworth, Nr. Pontefract (B., O.).
 1967 .. METCALFE, R. J. A., M.A., Trinity and All Saints Colleges, Horsforth, Nr. Leeds.
 1970 .. MIDDLETON, J., 18 Norton Terrace, Stockmoor, Nr. Huddersfield (B.).
 1969 .. MIDDLETON, A. L. V., B.V.Sc., M.R.C.V.S., 1 West End, Lund, Driffield (O., Z.).
 1970 .. MILBURN, G., A.M.I.Biol., Head of Biology, Glossop School, Glossop, Derbyshire (B.).
 1959 .. MILNE, C. D., 110 Thoresby Road, Acomb, York (B., O.).
 1958 .. MILNER, N. E., 245 Beverley Road, Kirk Ella, E. Yorks.
 1950 .. MILNES, Miss JOAN N., M.R.C.V.S., 83 Birkby Lodge Road, Huddersfield.
 1962 .. MITCHELL, R., 125 Chequer Avenue, Belle Vue, Doncaster (O.).
 1963 .. MOON, Miss BRENDA E., 10 Dale Royal Court, Cottingham, E. Yorks. HU16 4AD (B.).
 1954 .. MOORE, Mrs. E. M., Newnham, 6 Conan Gardens, Richmond, Yorks.
 1969 .. MOORE, Mrs. BETTY A., 36 Newfield Crescent, Dore, Sheffield (O.).
 1970 .. MOORHOUSE H., "Monnybrook", 2 Rydings Drive, Brighouse.
 1928 L. MOREHOUSE, Miss K. M., B.Sc., 95 Ardeen Road, Doncaster (C., F., M.).
 1962 .. MORGAN, Miss I. M., Daleside, Pool-in-Wharfedale, Otley.
 1946 .. MORLEY, I., 22 Stanley Road, King Cross, Halifax (O., Z.).
 1957 .. MOXON, Mrs. M. E., Briarfield, 116 Long Lane, Dalton, Huddersfield.
 1957 A. MOXON, Mr. C. S., Briarfield, 116 Long Lane, Dalton, Huddersfield.
 1946 .. MURGATROYD, F., Brockwell Lodge, Triangle, Halifax (B.).
 1969 .. MUSEUM AND ART GALLERY SERVICE FOR YORKSHIRE AND HUMBERSIDE, Farnley Hall, Leeds 12.
 1958 .. MYERS, F. H., 68 Norman Avenue, Bradford 2 (E.).
- 1961 .. NAYLOR, G. R., Bungalow 1, Milton Hall School, Brampton, Cumberland (O.).
 1931 .. NELSON, G. A., M.Sc., Ph.D., F.P.S., F.L.S., 37 The Crescent, Adel, Leeds 16 (B.).
 1960 .. NESS, M. H., 73 Cross Lane, Newby, Scarborough (O.).
 1956 .. NETTLETON, C., Tarn Cottage, Wold View Road, South, Driffield.
 1963 .. NEWCOMBE, Dr. J., 101 East Parade, Heworth, York.
 1968 .. NEWMAN, Lt. Col. J. F., St. Fillans, 88 Shipton Road, York (O.).
 1969 .. NEWTH, Miss J. A., 19 Eaton Road, Ilkley.
 1970 .. NICHOLSON, H., 8 Chudleigh Road, Harrogate (E.).
 1957 .. NORMAN, Miss M. M., Flat 21, Cumberland Court, 98 Cardigan Road, Leeds 6 (B.).
 1967 .. NORRIS, A., City Museum, Municipal Buildings, Leeds 1 (C.).
 1903 .. NOTTINGHAM, THE NATURAL HISTORY MUSEUM, Wollaton Hall, Wollaton, Nottingham.
- 1964 .. ODDIE, B., 13 Westfield Drive, West Bradford, Clitheroe, Lancs. (B.).
 1965 A. ODDIE, Mrs. E., 13 Westfield Drive, West Bradford, Clitheroe, Lancs..
 1968 .. OLDFIELD, P., B.A., 10 Danebury Drive, Acomb, York YO2 5EG (E., Z.).
 1956 .. OLDHAM, CENTRAL PUBLIC LIBRARY, ART GALLERY AND MUSEUM.
 1954 .. ONIONS, Mrs. W. J., Ph.D., 29 Exeter House, Putney Heath, London S.W.15.
 1964 .. ORPIN, R., Ratcliffe Lodge, South Luffenham, Oakham, Rutland (E., O.).
 1957 .. ORTON, P. D., M.A., A.R.C.M., Rannoch School, Rannoch Station, Perthshire (M.).
 1970 .. OSTERGARD, Miss O., J.P., Lower Cottage, Glaisdale, Whitby (B.).
 1963 .. OSTERFIELD, I., B.A., The Coach House, 4 The Hall Yard, Burton by Lincoln, Lincoln (O.).
 1967 .. O'SHEA, B. J., 23 Warminster Road, London S.E. 25 (Br.).
 1969 .. O'TOOLE, M. W., 6 Broom Mount, Leeds LS10 3NL (O.).
 1965 .. OUTHWAITE, Miss K. B., 74 Gillhurst Road, Birmingham 17 (O.).
 1968 .. OWEN, Capt. D. B., 16 Redcliff Drive, N. Ferriby, E. Yorks. (O.).
 1966 .. OXTOBY, J., 18 Tredgold Avenue, Bramhope, Nr. Leeds (B.).
- 1968 .. PAGET, R. J., B.Sc., M.B., Ch.B., Glebe Farm House, Harthill, Nr. Sheffield (B., Z.).
 1968 .. PALMER, M. J., 55 Wellington Road, Wilsden, Bingley, Yorks. (O.).
 1962 .. PARKER, D. H., 3 Hillway, Tranmere Park, Guiseley, Nr. Leeds (O.).
 1958 .. PARKINSON, R. C., Flat 4, 10 Crossbeck Road, Ilkley.
 1963 .. PARKSON, F. G., c/o Richardson & Co. Ltd., Heating Engineers, Neasham Road, Darlington (O.).
- 1956 .. PASHBY, B. S., 408 Cottingham Road, Hull (O.).
 1963 A. PASHBY, Mrs. G., 408 Cottingham Road, Hull.
 1946 L. PATRICK, H. A., Bennachie, Cinders Walk, Goldsborough, Knaresborough.
 1969 .. PAYER, Mrs. N., 92 Thirsk Road, Northallerton.
 1941 .. PAYNE, K. G., B.Sc., A.R.C.S., Corylus, Hagg Lane, Colton, Tadcaster (E.).
 1945 A. PAYNE, Mrs. J., Corylus, Hagg Lane, Colton, Tadcaster (B., E.).
 1945 L. PEARCE, Rev. E. J., M.A., F.R.E.S., The House of the Resurrection, Mirfield (E.).
 1969 .. PEARSON, P., 3 Maple Grove, Fulford Road, York (O.).
 1959 .. PEART, F. A., 20 Clifton Crescent, Wheatley Hills, Doncaster (O.).
 1960 .. PEASE, Miss M. A., Orchard Villas, Wilfred Avenue, Selby Road, Whitkirk, Leeds 15 (B.).
 1968 .. PEEL, Mrs ENID F., Oakridge, Summerbridge, Harrogate (O.).
 1961 .. PEMBERTON, R. T., B.Sc., Ph.D., 28 Maude Avenue, Baildon, Shipley (O., Z.).
 1966 .. PENROSE, R. J., City Museum, Municipal Buildings, Leeds LS1 3AA (B., E., O.).
 1965 .. PHILLIPS, G. D. R., Underbergh, Victoria Street, Settle.
 1970 .. PICKARD, Miss J., The Old Vicarage, Burton Leonard, Yorks. (Z.).
 1955 .. PICKUP, Dr. J. D., Surrey House, Carleton, Pontefract (O.).
 1953 .. PILKINGTON, A., Craiglea, Coates, Barnoldswick, Colne, Lancs. (O., Z.).
 1969 .. PILLING, C. G., 93 Centre Vale, Triangle, Halifax (B., Z.).
 1925 .. PING, A. W., M.A., F.R.Met.S., Flat No. 1, Aldersdy Court, Dringhouses, York YO2 2QN (M.).
- 1950 .. PLATT, A. E., 57 Town Moor Avenue, Doncaster (O.).
 1961 .. POLLARD, R. S., Ackworth Cottage, Cloughton, Scarborough.
 1970 .. POTTER A., Howefield, Baldersby, Thirsk (E.).
 1969 .. PREECE, T. F., M.Sc., School of Agricultural Sciences, University, Leeds LS2 9JT (M.).

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- 1968 .. PRESTON, B. S., 165 Leeds Road Harrogate (B., O.).
- 1969 .. PRIESTLEY, G. W., 54 Falcon Road, Bingley, Yorks. (O.).
- 1969 A. PRIESTLEY, Mrs. M. G., 54 Falcon Road, Bingley, Yorks.
- 1948 .. PRINGLE, G. E., M.A., Ph.D., A.Inst.P., Dept. of Inorganic and Structural Chemistry, University, Leeds LS2 9JT.
- 1968 .. PROCTOR, D., "Lyndhurst", Woodbine Street, Ossett.
- 1958 .. PROSSER, Mrs. M., F.R.E.S., Whitley House, Clint, Ripley, Harrogate (E.).
- 1969 .. PULLAN, A. C., "Rosedene", 16 Rufford Bank, Yeadon, Nr. Leeds (E.).
- 1960 .. PYRAH, Mrs. M., 3 Sheepwalk Lane, Townville, Castleford (B.).
- 1960 A. PYRAH, C., 3 Sheepwalk Lane, Townville, Castleford.
- 1969 .. PYRAH, Dr. R. D., 50 Raikeswood Road, Skipton (B., O.).
- 1958 .. QUIN, P. C., Croft House, 51 Leylands Lane, Bradford 9 (E., O.).
- 1969 .. RAINSBURY, Miss E. W., The College of Education, Ripon (O.).
- 1953 .. RANKIN, Dr. M. N., M.B., Royd Cottage, Hemsworth, Nr. Pontefract (O.).
- 1959 .. RATCLIFF, E. W., 408 Otley Road, Adel Leeds 16 (F., Z.).
- 1965 .. RECKITT, Mrs. MARY J. P., The Elms, Roos, Nr. Hull.
- 1958 .. REID, W., 6 Whirlow Park Road, Sheffield 11 (E.).
- 1970 .. REYNOLDS, L., 48 Gledhow Park Grove, Leeds 7 (O.).
- 1960 .. RHODES, R. J., 11 Langdale Drive, Scawthorpe, Nr. Doncaster (O.).
- 1962 .. RICHARDS, E., 152 Holgate Road, York (E.).
- 1966 .. RICHARDSON, M. J., Dept. of Agriculture and Fisheries for Scotland, East Craigs, Edinburgh 12 (M.).
- 1966 .. RIDER, A. H., c/o Physiotherapy Dept., Sarnia General Hospital, Sarnia, Ontario, Canada (O., Z.).
- 1958 .. RIDGWAY, Miss P., 22 Birkdale Close, Kirk Ella, Nr. Hull.
- 1959 .. RILEY, J. L., M.B., Ch.B., Brookfield, Yeadon, Nr. Leeds (O.).
- 1934 .. Rob, Miss C. M., F.L.S., Catton Hall, Thirsk (B.).
- 1946 A. ROB, C. G., M.A., F.R.C.S., Catton Hall, Thirsk
- 1962 .. ROBERTS, F. C., 14 Lyndhurst Grove, Huddersfield Road, Brighouse (O.).
- 1950 .. ROBERTSON, Miss JOYCE, 24 Hallcroft Lane, Copmanthorpe, York (Br.).
- 1960 .. ROBERTSON, Prof. F. N., M.A., B.Sc., Ph.D., School of Agriculture, West Mains Road, Edinburgh 9 (B., M.).
- 1954 .. ROBINSON, E., 8 Sun Wood Avenue, Shelf, Halifax (C.).
- 1964 .. ROBINSON, D. L., 1 Altar Drive, Bradford 9 (O.).
- 1964 .. ROBINSON, F., Wycoller, 23 Nook Road, Scholes, Leeds.
- 1965 .. ROWLEY S. G., Glen View, 41 Ravensthorpe Road, Thornhill Lees, Dewsbury.
- 1946 L. ROWNTREE, M. H., 23 Upland Park Road, Oxford.
- 1951 .. ROYAL ENTOMOLOGICAL SOCIETY, 41 Queensgate, London S.W.7.
- 1960 .. RUSHFORTH, D. A., 34 Harecroft Road, Otley (O.).
- 1969 .. RUSSELL, M. R., 40 Wellclose Terrace, Leeds LS7 1HT (E.).
- 1960 .. RUTHERFORD, C. I., Longridge, Macclesfield Road, Alderley Edge, Cheshire (E.).
- 1959 .. SANDERSON, Miss M. R., 51 Lancaster Park Road, Harrogate (O.).
- 1947 .. SAYLES, W. J., Allerton House, 3 Windsor Road, Doncaster.
- 1966 .. SCALING, Mrs. C. E., 17 West Auckland Road, Eastlingier.
- 1963 .. SCHOFIELD, T., Whinfield Nurseries, The Marsh, Earls Brierley, Nr. Bradford (B.).
- 1959 .. SCOTT, H. E., 47 North Street, Hyde Park, Doncaster.
- 1945 .. SCOTT, H. J. A., Yewcliffe, Charney Road, Grange-over-Sands, Lancs.
- 1945 A. SCOTT, Mrs., Yewcliffe, Charney Road, Grange-over-Sands, Lancs.
- 1922 .. SCOTT, Miss L. I., 96 West Coker Road, Yeovil, Somerset (B., Br., F.).
- 1963 .. SEARES, Miss E. G., 5 Brooklyn, Grassington, Skipton (B.).
- 1961 .. SEAWARD, M. R. D., M.Sc., Trinity and All Saints Colleges, Horsforth, Nr. Leeds (Br.).
- 1946 .. SHADDICK, Miss C., M.A., Flat 9, Strayside Court, Victoria Avenue, Harrogate (B., O.).
- 1958 .. SHAW, Rev. C. E., Waterhead Vicarage, Oldham, Lancs. (B.).
- 1938 .. SHAW, G. A., 33 Temple Rhydding Drive, Baildon, Shipley (B., Br.).
- 1936 .. SHEARD, G. F., 4 Torton Hill Road, Arundel, Sussex.
- 1886 .. SHEFFIELD CITY LIBRARIES, Central Free Library, Surrey Street, Sheffield.
- 1929 .. SHEFFIELD CITY MUSEUM, Weston Park, Sheffield 10.
- 1961 .. SHEPLEY, Miss M., 12 Raikes Avenue, Skipton.
- 1969 .. SHIMELD, Mrs. M. E., 7 Glenview Grove, Shipley, Yorks. (O.).
- 1970 .. SHORROCK, B., 7 East View, Settle, Yorks.
- 1959 .. SIMMS, C., B.A., Manor Cottage, Museum Gardens, Museum Street, York (G., O., Z.).
- 1969 .. SIMMS, Mrs. J. D., Manor Cottage, Museum Gardens, Museum Street, York.
- 1967 .. SIMPSON, C., 17 Sutherland Grove, Norton, Stockton-on-Tees, Durham.
- 1946 .. SIMPSON, N. D., M.A., F.L.S., 3 Cavendish Road, Bournmouth (B.).
- 1964 .. SIMPSON, G., 1 Oak Cottages, Mundford Road, Brandon, Suffolk (B., M., O.).
- 1966 .. SKIDMORE, P., Dept. of Natural Sciences, Museum and Art Gallery, Chequer Road, Doncaster (E.).
- 1954 .. SKINNER, E. S., Sage Meadow, Shannon Close Ilkley (O.).
- 1958 .. SLATER, Dr. M. E., Lastingham, York.
- 1947 .. SLATER, R., Rosedale, Hempstead Rise, Uckfield, Sussex.
- 1963 .. SLATER, W., 22 Crescent Road, Netherton, Huddersfield (O.).
- 1971 .. SLEEP, Miss ANN, B.Sc., Ph.D., Dept. of Botany, University, Leeds LS2 9JT (B.).
- 1923 .. SLEDGE, W. A., B.Sc., Ph.D., 9 St. Chad's Drive, Leeds 6 (B., M.).
- 1961 A. SLEDGE, Mrs. M., B.A., 9 St. Chad's Drive, Leeds 6.
- 1969 .. SMEED, J. A., 20 Grove Lane, Knottingley (O.).
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- 1953 .. SMITH, A. H. V., B.Sc., 69 Hallam Grange Crescent, Sheffield 10.
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- 1960 L. SMITH, Miss M. C., B.Sc., 11A South Drive, Sandal, Wakefield.
- 1965 .. SMITHSTONE, T., 23 Radnor Way, Intake, Doncaster (Z.).
- 1964 .. SPALDING, D. A. E., B.Sc., F.G.S., A.M.A., Box 308, Spruce Grove, Alberta, Canada.

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- 1934 .. SPAUL, PROF. E. A., D.Sc., Ph.D., 6 Churchdown Road, Poolbrook, Malvern Common, Malvern, Worcs. (F.).
- 1964 .. SPFAKE, B., Greenhow, West Rounton, Northallerton.
- 1949 .. SPITTLE, R. J., "Wayland Cottage", Tedburn St. Mary, Exeter (E.).
- 1964 .. STEAD, P. J., M.B.O.U., 25 Minsterley Drive, Acklam, Middlesbrough (O.).
- 1960 .. ST. ANDREWS, University of, Botany Dept., St. Andrews, Scotland.
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- 1945 .. STEMBRIDGE, H. L., Hall Farm, Crakehall, Nr. Bedale, Yorks. (O.).
- 1952 .. STEPHENSON, K. M., East End Farm, Patrington, E. Yorks.
- 1959 A. STEPHENSON, BARRIE, East End Farm, Patrington, E. Yorks.
- 1956 L. STERNE, E. C., M.A., 43 Roper Avenue, Leeds LS8 1L6 (O.).
- 1960 L. STERNE, Mrs., 43 Roper Avenue, Leeds LS8 1L6.
- 1968 .. STEVEN, Miss I. J., "Marimba", Studley Road, Ripon (B., O.).
- 1968 A. STEVEN, Mr. P. M., "Marimba", Studley Road, Ripon.
- 1970 .. STONE, W. J., 73 Far Bank, Shelley, Huddersfield (B.).
- 1933 L. STUBBS, F. B., 62 High West Road, Crook, Co. Durham.
- 1964 .. STUTTARD, P., 24 Hayward Close, Highfield Estate, Willesbrough, Ashford, Kent (B., G., O., Z.).
- 1964 .. SUMMERSGILL, Miss A., Greenlea, Glasshouses, Pateley Bridge, Harrogate (O.).
- 1961 .. SUMMERTON J., F.R.E.S., F.R.H.S., 81 Leeds Road, Tadcaster (B., E.).
- 1963 .. SUTCLIFFE, H. D., Welwyn, 19 Moorway, Guiseley, Nr. Leeds (B.).
- 1971 .. SUTCLIFFE, R., 284 Stanks Drive, Leeds 14 (O.).
- 1967 .. SUTTON, Dr. S., Zoology Dept., University, Leeds LS2 9JT.
- 1956 .. SWALLOW, P., 19 Broomfield, Adel, Leeds LS16 6AE (O.).
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- 1969 .. SYKES, J. H., 10 Roman Rise, Pontefract (O.).
- 1955 .. TANNETT, P. G., 16 Gledhow Wood Avenue, Leeds 8 (E.).
- 1911 H.L. TAYLOR, E. W., C.B.E., F.R.S., 11 The Avenue, York (O., Z.).
- 1965 .. TAYLOR, L., 382 Blackmoorfoot Road, Crosland Moor, Huddersfield HD4 5NP (O.).
- 1968 .. TAYLOR, Miss M., 16 Thoresby Close, Bempton Lane, Bridlington (B.).
- 1968 .. TAYLOR, R. E. B., West View, Huddersfield Road, Mirfield (B., E.).
- 1966 .. TEALE, C., 8 Glaisby Court, Heworth Village, York YO3 0AR (O.).
- 1951 .. TETLEY, Miss M. I., 2 Bodden Croft, Fernleigh Road, Grange-over-Sands, Lancs. (B.).
- 1935 .. TETLEY, Brigadier J. N., The Brewery, Leeds 10.
- 1945 .. THOMPSON, E., 14 Ravens Avenue, Scout Hill, Dewsbury (Br., C., F.).
- 1936 .. THOMPSON, Mrs. S., 23 Regent Crescent, Skipton (B., M.).
- 1969 .. THOMPSON, F. J., M.B.O.U., 18 Stepney Road, Scarborough (O.).
- 1970 .. THOMPSON, Dr. M. M. J., Ferndale, 23 The Meadows, Skelton, York (O., Z.).
- 1959 .. TODD, Dr. DORIS, M.B., B.S., Pasadena, Grammar School Lane, Northallerton (B., O.).
- 1945 .. TOLSON MEMORIAL MUSEUM, Ravensknowle, Huddersfield.
- 1954 .. TOMLINSON, T. B., L.D.S., R.C.S., Bonfield, 12 Lake Street, Leighton Buzzard, Beds.(B.).
- 1968 .. THRUSSELL, G., 3 Heights Green, Leeds 12 (O.).
- 1958 .. URQUHART, Rev. D. C., M.A., Rowley Rectory, Little Weighton, Hull (O.).
- 1967 .. UPTON, T. W., Sternes, Westwood, Beverley (O.).
- 1969 .. UTTLEY, J., 10 King Street, Mytholmroyd, Halifax (B.).
- 1945 .. VALENTINE, Prof. D. H., M.A., Ph.D., Dept. of Botany, University, Manchester 13 (B.).
- 1962 .. VARTY, J., Laurel Bank, Fritchley, Derbyshire (M., Z.).
- 1965 .. VAUGHAN, R., 102 Westbourne Avenue, Hull (O.).
- 1920 .. VERSEY, Prof. H. C., D.Sc., 1 Stainburn Terrace, Leeds 17 (G.).
- 1968 .. VERNON, Miss N. G., 22 Parish Ghyll Road, Ilkley (B.).
- 1969 .. VICKERS, Miss D. E., 14 Osborne Road, Sheffield S11 9AY (B.).
- 1964 .. WADDINGTON, L. G. F., 9 Greenleaf Avenue, Wheatley Hills, Doncaster (E.).
- 1946 .. WALKER, A. B., The Hags, Grosmont, Whitby (O.).
- 1947 .. WALKER, A. F. G., 14 St. Helen's Road, Harrogate (O.).
- 1968 .. WALKER, J., 48 School Street, Moldgreen, Huddersfield HD5 8AU (O., Z.).
- 1954 .. WALKER, Miss D. R., 99 Otley Road, Harrogate (B., O.).
- 1966 L. WALKER, J. E. S., 27 Westgate, Hornsea (B., O.).
- 1969 .. WALKER, K. R., "Sycamores", Welton Road, Brough, E. Yorks. (B.).
- 1941 .. WALLACE, E. C., 2 Strathearn Road, Sutton, Surrey (B., Br.).
- 1952 .. WALLIS, A. J., 5 South Avenue, Scalby, Scarborough (O.).
- 1954 .. WALLIS, O. H., 7 Castle View, Sheriff Hutton, York (O.).
- 1968 .. WALLIS, A. W., 54 Westminster Avenue, Holderness Road, Hull (O.).
- 1969 .. WALPOLE, M., 68 Outwoods Road, Loughborough, Leics.
- 1970 .. WARBRIDGE, J. P., B.Sc., 71 Acklam Road, Middlesbrough, Teesside (Z.).
- 1930 .. WARD, A. B., B.A., Gorse Hill, Baslow, Bakewell, Derbyshire (B.).
- 1966 .. WARD, E., 87 Malvern Avenue, Acomb, York.
- 1953 .. WARD, Miss C. A., Flat G, Ouselthwaite Hall, Nr. Barnsley (O.).
- 1969 .. WARD, J., Greenhill Nurseries, Hill End Road, Armley, Leeds 12 (O.).
- 1963 .. WARDALE, H. F., A.R.P.S., Whitefields Cottage, Studley Park, Ripon (B., O.).
- 1963 A. WARDALE, Mrs., Whitefields Cottage, Studley Park, Ripon.
- 1969 .. WARDMAN, F. A., 8 Sedbergh Park, Ilkley (O.).
- 1965 .. WATKINSON, L. J., M.Sc., Ph.D., A.R.I.C., Hallin, 95 Cookridge Lane, Leeds 16.
- 1953 .. WATLING, R., B.Sc., Ph.D., 36 Orchard Brae Gardens, Edinburgh 4 (M.).
- 1967 .. WEAR, E. H., 116 Ancaster Avenue, Hull (B.).
- 1949 .. WEBB, C. W., 4 High Shaw Mills Cottages, Shaw Mills, Nr. Harrogate (O.).
- 1947 .. WEBSTER, Prof. J., Dept. of Biology, Hatherley Laboratories, Prince of Wales Road, Exeter EX4 4PS (M.).
- 1970 .. WEBSTER, Mrs. R., Coverham Abbey, Leyburn, Yorks. (B.).
- 1955 .. WERTH, Miss I., M.A., Dept. of Zoology, University, Leeds LS2 9JT (O., Z.).
- 1971 .. WESTON, S. J., F.R.I.C.S., 30 Flintham Court, Mansfield, Notts. (O.).

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 1962 .. WHITE, O. S., 19 Riley Park, Kirkburton, Huddersfield (O.).
 1970 .. WHITTON, Dr. B. A., Botany Dept., University of Durham, South Road, Durham (F.).
 1946 .. WILKINSON, Miss J. E., Holmleigh, Sleights, Whitby (M.).
 1946 .. WILKINSON, Mrs. T., Holmleigh, Sleights, Whitby (M.).
 1939 .. WILKINSON, Mrs. E., Bolton Hall Farm, Wilberfoss, York.
 1956 .. WILKINSON, G. R., 4 Plompton Close, Harrogate.
 1949 .. WILLBOURN, Miss E., 22 St. Johns Avenue, Bridlington.
 1963 .. WILLIAMSON, The Rev. Dr. R., M.A., 32 Shannon Drive, The Mount, Outlane, Huddersfield (O.).
 1963 .. WILSON, A., 22 Askham Lane, Acomb, York (E.).
 1961 .. WILSON, C. H., 2 Ancaster Road, Leeds 16 (O.).
 1958 .. WINDEMER, Miss O., 64 Tewit Well Road, Harrogate.
 1967 .. WINTER, P. Q., 1 Cook's Row, West Street, Muston, Filey (E., O.).
 1962 .. WOOD, R. L. S., F.C.A., 32 Lightridge Road, Fixby, Huddersfield.
 1962 .. WOOD, T., A.T.I., 111 Kenley Parade, Wibsey, Bradford 6.
 1963 .. WOOD, J., 118 New Hey Road, Rastrick, Brighouse.
 1956 .. WOODWARD, A. H., The Sheilings, Ripley Road, Knaresborough.
 1947 .. WORMALD, R. F., The Old Vicarage, Foston, York.
 1947 .. WORSLEY, Mrs. H. M., The Pantiles, 31 Moor Lane, Strensall, York.
 1946 .. WORSLEY, Lady JOYCE, Hovingham Hall, York.
 1950 .. WRAY, Miss M., The Bield, Low Laithe, Summerbridge, Harrogate (O.).
 1958 .. WRIGHT, A. D., Spring Hall Lodge, Denholme Gate Road, Shelf, Nr. Halifax.
 1964 .. WRIGHT, A. H., 28 Elmwood Avenue, Woodlands, Nr. Doncaster.
 1941 .. WRIGHT, C. W., B.A., F.G.S., 37 Phillimore Gardens, London W.8 (G.).
 1962 .. WRIGHT, P. M., 61 Regent Crescent, Skipton (G., O.).
 1935 .. YEOMAN, Miss RUTH, 37 North End, Osmotherley, Northallerton.
 1934 .. YEOMAN, Miss K. P., Hannah's Garth, Osmotherley, Northallerton.
 1946 .. YORKSHIRE OUSE RIVER BOARD, 21 Park Square South, Leeds 1 (F.).

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